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Table of Contents

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ORIGINAL ARTICLES—	Page.	BRITISH MEDICAL ASSOCIATION NEWS—	Page.
The Charles MacKay Lecture, by F. DURAS ..	899	Scientific ..	930
Papilloedema, by ARTHUR JOYCE ..	906	Nominations and Elections ..	935
Papilloedema, by C. T. CH. DE CRESPIGNY ..	911		
Infantile Eczema, by HELEN M. MAYO, O.B.E., M.D.	914	RESEARCH—	
Infantile Eczema, by JOHN H. KELLY, M.D., M.R.C.P. ..	918	Paspalum Ergot ..	935
REPORTS OF CASES—		CORRESPONDENCE—	
Teratoma of the Ovary in a Child, by J. J. SEARBY, M.B., B.S. ..	922	Inflammatory Stricture of the Rectum ..	935
		The Genito-Ano-Rectal Syndrome (Lymphopathia Venereum) ..	935
REVIEWS—		Common Problems in General Practice ..	936
Neurosis and the Modern World ..	923	The Cause of Trachoma ..	936
Blood Disorders ..	923	Tuberculosis ..	937
Vitality and Energy ..	924		
Surface Anatomy ..	924	UNIVERSITY INTELLIGENCE—	
		The University of Sydney ..	937
LEADING ARTICLES—			
Nutrition ..	925	OBITUARY—	
		Walter Alexander Ramsay Sharp ..	937
CURRENT COMMENT—			
Pituitary Diabetes ..	926	BOOKS RECEIVED ..	938
Acute Appendicitis in Children ..	927	DIARY FOR THE MONTH ..	938
		MEDICAL APPOINTMENTS VACANT, ETC. ..	938
ABSTRACTS FROM CURRENT MEDICAL LITERATURE—		MEDICAL APPOINTMENTS: IMPORTANT NOTICE	938
Surgery ..	928	EDITORIAL NOTICE ..	938

The Charles MacKay Lecture.¹

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of Melbourne.

THE basic idea of this lecture, as stated by its founder, Miss MacKenzie, is to combine the history of medicine with the history of mankind. You will agree with me that, directed by such an aim, we gain the deepest knowledge not only of the history of medicine, but of history altogether. The science of history is created by the human desire to be in contact with the eternal stream of life from past to future; by history we recognize that we human beings of today are one essential link in an unbreak-

able chain, thus having the duty of gratitude towards our ancestors and the duty of responsibility towards our successors. Furthermore, nothing can show us better than history the truth of the words of Ranke, the great historian:

The highest aim a man may reach on this earth will be to defend by his own professional work the interest of the community.

This statement, it seems to me, has been proved by the life of Charles MacKay.

Speaking today about the relations between physical education and preventive medicine, I should like to divide my address into two parts. In the first part I shall give you a general survey of the historical facts about physical education, and especially about preventive medicine, and secondly I shall deal with modern ideas of physical education in their connexion with preventive medicine, and give you a short report about the new course of physical education at the University of Melbourne.

¹ Delivered at the Australian Institute of Anatomy, Canberra, on September 28, 1937.

Historical.

The idea of preventive medicine is a very old one, and we find it in nearly all times and peoples. A very typical example is the carrying of amulets as a safeguard against diseases. With primitive people, for example in New Zealand, we see children painted with strips and ornaments of white colour, either on the face or covering the whole body, to secure them against the evil spirits of illnesses, and in the case of other primitives, sticks through the nose prevent bad ghosts from entering the body and making people ill. All this sounds very primitive indeed. When we speak of preventive medicine we think with gratitude and perhaps with a little pride of the famous English physician Jenner, who in 1798 published his pamphlet about vaccination. But you will be astonished to hear that a very primitive people indeed, the Bambuti, a tribe of African pygmies of the Congo, purposely infect their children with frambesia (bubas) to make them immune. The mode of living of the Bambuti is pre-stone age! They have never acquired the ability to form tools from stone or any other material than wood; but they know immunization.

Interesting facts which bring us nearer to the connexion between physical education and preventive medicine we find with the Indians of north and middle America; I refer to the widespread usage of the hot-box. This is used not only for cleansing and refreshing the body after strenuous work, hunting and fishing, or after wars and battles, but also to give strength and resistance to sickness before difficult and dangerous enterprises. In this connexion I may mention that scarifying and blood-letting are frequently used to give better health, and sometimes it is thought that the loss of blood may give strength, perseverance, bravery, diligence and skill—qualities we try to develop by education. With these people the idea of sacrifice is behind all these acts, which is equally evident from the well-known connexion between priest and physician, which you find nearly everywhere in the world of primitives and in old times. But on the other hand there is no doubt that these primitive preventive measures work in a way that is physiologically explicable. Some of the American Indians have an exact scheme for their scarifications. The legs are scarified as a preparation for long marches, the arms to prevent fatigue in rowing. The blood produced by these manipulations is often used by other people, who apply it on the skin to prevent diseases. You could say: "Some astonishing kind of indirect preventive medicine through physical fitness; the blood of an athlete is a means of defending another person against diseases." The Indian naturally thinks of it as a safety colour against devilish ghosts.

The idea of prevention by the suffering of bodily pains is very widespread. The Indians I have already mentioned as an example; you find the same idea more distinctly expressed in the so-called *mora* therapy of the Japanese. Little sticks of an easily inflammable material are applied to certain

points of the skin and are then lighted. This very painful method is used for healing as well as for prevention. It may be interesting to know that this so-called "moxibustion" has been used also for educational purposes. To slap children is regarded as barbarous, and when a child is not obedient moxibustion is applied. You see how different the meanings of "barbarous" may be!

After these preliminary remarks about primitive people chiefly, in whom we find no obvious connexion between preventive medicine and physical education in our sense, even no physical education at all, we turn to the history of people in whom this connexion is quite evident. There are first the Chinese. The French missionary Amiot reported in 1779 that the Chinese had a very old system of physical education, or better, exercises, created in 2698 B.C. by the emperor Hoang Ti. This system, which was renewed in A.D. 500 by the Buddhist monk Tamo, consists of a very detailed and complicated number of exercises for every part of the body, which serve not only as therapy, but also as a means of prevention against diseases and as a means to acquiring immortality of the soul. To every movement belongs a special breathing exercise, for which the special kind of breathing is exactly prescribed. It is interesting that you sometimes find the idea expressed by historians that Ling, the well-known Swedish teacher, has been influenced by these old Chinese gymnastics; and indeed, some of Ling's exercises are very similar to the Chinese ones.

The Frenchman Dally, in 1857, said that the old Chinese already knew something about resistance exercises and that the resistance had been given either by another man or by sacks filled with stones.

Another Chinese system of physical exercises, founded by General Yo Fei (A.D. 1102-1142), was intended not only to strengthen the people for military purposes, but also to give them power of resistance against sickness. This system has developed today into a kind of shadow-sparring between two opponents, and is nothing but a very strenuous dance, performed according to exactly prescribed rules for every step and each movement by one or more couples of dancers or warriors. A remarkable description of this highly developed system is given in the book "Physical Education in China", by Gunsun Hoh, published in Shanghai in 1926.

As you know, the so-called *Vedha*, written in about 1800 B.C., contain the old Indian wisdom. Since the discovery by Sir William Jones of the *Atharva Vedha*, which contains the medical part, *Ayur Vedha*, a great number of English authors have written about the old Indian medicine. The most complete work is the "Commentary on the Hindu System of Medicine", published in Calcutta in 1845 by Dr. Wise. We read there the following advice from the *Ayur Vedha*: "Rise very early, clean your mouth, anoint your body and then begin exercises, and lastly apply massage"—or, as Dr. Wise writes, "shampoo". This was the English word for massage during the last century; often the

word "rubbing" has been used, and the masseurs have been called "bone-setters".

The most important historical facts about our subject we hear, as you may expect, from the old Greeks and Romans. Here, indeed, we find the real source of physical education and its connexion with preventive medicine. As I think that one of the aims of history is the provision of opportunities for acquaintance with the high-minded personalities of the past, and not a mere enumeration of names and figures, I have chosen only a few remarkable men, most of whom shall speak to you in their own words. As I thought it too difficult a task for me to give men like Hippocrates, Plato or Galen an order of rank, I present them to you in order of time. So before we speak about Hippocrates, the great physician, we have to mention Pythagoras, the famous philosopher, mathematician and educationist, whose theorem has worried us all as boys and girls, and who lived before 500 B.C. In his school not only philosophy and mathematics, but also physical activities were taught, as for example running, wrestling, exercises with dumb-bells, and, what is most remarkable, preparatory exercises to develop special bodily skill. So we are right in speaking about the "scientific basis" Pythagoras gave to his physical exercises.

A few years later (500 B.C.) Herodicos of Selymbria is reported to have developed a very detailed system of gymnastics, and he was the real founder of medical gymnastics. He regarded gymnastics as the most measurable, the most reasonable and the noblest kind of bodily activities, and brought gymnastics into relation with dietetics. During this time was created the "gymnast" (*γυμναστής*), the scientifically trained teacher of physical culture. Herodicos discriminated distinctly between this "gymnast" (who had to know not only the technique, but also the effect of physical exercises) and the "paidotribes" (*παιδοτρίβης*), that is, the teacher of the technique only. It is obvious that knowledge of the influence of physical exercises on the body is the first step in the recognition of physical education as a means of preventive medicine. Furthermore, we see that during this time the idea had already been developed that the training of the mind had to be combined with the training of the body.

And now we shall hear about Hippocrates of Kos, the most famous physician of all times. He lived from 460 to 377 B.C., and one of his sentences especially could be used as an explanatory introduction for every speech about physical education as well as about preventive medicine:

All parts of the body which are designed to be used, will stay healthy, will grow well and will remain young if they are used in the right way and if they are trained sufficiently, each of them in the manner in which they are to be used; but if you do not use them, they will become ill, they will shrink and will grow old before their natural time.

These simple words, I think, reveal to us the whole problem of physical education and preventive

medicine; and when later on we speak about modern ideas of this subject, we shall keep these words of Hippocrates in mind. But we have to learn many things more from this great man. More exactly than Herodicos, Hippocrates as a physician pointed out the connexion between dietetics and gymnastics; and is not this the case with regard to modern researches on metabolism? A very important sentence is this: "The man who eats cannot stay healthy if he does not also perform physical exercises." Hippocrates knew quite exactly that food alone was of no value for the body if there was no real balance between consumption of energy and its replacement. And so he continued:

In spite of the fact that the exercises and the foodstuffs have opposite effects they both are essential for real health. The purpose of exercises is this: to consume the energies; but the foods and beverages shall replace them. Therefore the "dietician" has to know the effect of exercises, and of those as well which are given by Nature itself, as of very strenuous exercises. He has to know the exercises which give us an increase or decrease of muscle flesh. He has to know the right relation between physical exercises, amount of food, human nature, the age of the body, the seasons, the changings of the winds, the situation of the place where one lives, and the weather conditions of the year. Also he has to know the way and times of the stars—and only by knowing all this he may be able to give a right judgement about all these influences from which the sicknesses originate. But even if the dietician knows all that, it would not be sufficient. Only if he is able to determine the right amount of food and the amount of exercise of every single person, only then he may secure real health.

I think it a proof of fundamental knowledge of preventive medicine that Hippocrates should say that illness does not occur suddenly,

but the illness accumulates very slowly within the human body and only later on it becomes apparent. And the dietician has to know this slow accumulation of bad stuffs by certain signs—he must have the knowledge of prognosis and therefore of prevention.

Here we see, for the first time, a real basis for that famous and well-known dictum: "Prevention is better than cure." As a means of prevention, Hippocrates already knew muscle exercises, bathing and massage for "tissue-weaklings". A most modern standpoint is seen in his words:

With every single case the whole person has to be treated; the whole kind of living has to be regulated; there must be a reasonable distribution of sleep, rest and movement, and work and recreation, and we have to keep in mind the natural therapeutic factors of sun, fresh air and dietetics.

You see that to call this most modern is right, and you will agree that it has been worth while to speak so fully about Hippocrates.

The next man we have to mention is the great philosopher Plato (427-347 B.C.). In him already we find distinctly the discrimination between physician and teacher of physical culture, and we see furthermore the first development of professionalism by athletes. With Plato we find a very remarkable similarity to the modern training and qualifications of the teacher of physical culture in the following sentence:

Teachers of physical culture have to have first of all a thorough knowledge of physiology; that means they have to know the nature of the human body and its functions not only during healthy days, but also during sickness.

Sickness naturally was more important for the physician.

Plato, proud at being a really good citizen, who considered his duties more than his rights, naturally regarded physical exercises as one of the best means of preparation for war; but he always had in mind also the preventive and medical aspect of exercises:

Only if exercises are wisely and carefully applied they will give to men bodily well-being, and the right amount of exercises can be told you only by the teacher of physical culture and by the physician respectively. Gymnastics and medicine are sisters.

Lastly, I should like to quote two sentences of Plato, which are most important for modern gymnastics too:

Gymnastics shall accompany the man through his whole life, from earliest youth to his latest years . . . Gymnastics have to be simple.

This latter sentence is fundamental.

Plato's pupil Aristotle (388-322 B.C.) devoted his special attention to exercises for youth. It is interesting (and perhaps it is one of the first signs that at this time exercises were beginning to occupy too broad a place within education) that he asked that there should be no physical exercises during the period between fourteen and seventeen years, but that this time should be devoted entirely to the education of the mind. He, more distinctly than Plato and Socrates, fought against professionalism in athletics, especially against too high a specialization, against which he put his ideal of an all-round athlete (he recommended the pentathlon). He advocated individual exercises and, what is more important with regard to preventive medicine, he asked for compensatory work against the injuries of a one-sided occupation. One paragraph of his writings I should like to give you literally because of the importance of his ideas about the value of competitions for younger boys:

Until adult age we should apply only easier exercises and should not afford a specially rigid diet or special strenuous exercises. Otherwise growth would be hindered. There is one proof for the damage done by premature strenuous exercises in the remarkable fact that you will find in the list of victors at the Olympic Games only two or three names of boy victors who have gained victories later on when they became grown-ups. The reason is the amount of vital energy that has been lost by these strenuous exercises during youth.

I think you will agree that by considering the ideas of Aristotle we may gain some valuable hints concerning physical education today.

To complete our acquaintance with the old ideas about physical education and preventive medicine we have to mention two names more: Flavius Philostratus (A.D. 195-250) and Claudius Galen (A.D. 129-199). Both wrote quite a number of books about gymnastics, and Galen the physician influenced

medicine until the end of the Middle Ages. (Finally it was the famous Harvey (1578-1657) who, by his description of the blood circulation in 1628 defeated one of the last survivals of Galen's influence.)

From Philostratus we possess a very important book, "About Gymnastics" (*γυμναστικής*), which I think every modern teacher of physical culture should read. For instance, Philostratus gave quite exact advice for sunbathing, which we could print in every paper of today. He said:

The fools go sunbathing with every kind of sunshine and without any discrimination; but reasonable people do not go always sunbathing, and if they do, only as long as it is good for them. Especially youth should not lie lazy on the beach and bake, but should use their young vital energy and move and exercise.

Philostratus, too, invented the term so significant for the aim of gymnastics, the "kalokagathia"—that which is beautiful with regard to the body and good with regard to the character. Philostratus thought of gymnastics as of a special subject, but Galen, as a physician, called gymnastics one part of medicine and of hygiene. With regard to this difference, which continues until today, I think we might find the more reasonable solution in recognizing that gymnastics are the continuation of medicine as well as medicine being the continuation of gymnastics. How medicine and gymnastics may work together could not be explained better than by the following words of Galen:

As the health goes through three phases, firstly the *oxiety* (unstable state of health), secondly the *ēstis* (habitual state of health), and thirdly the *eutētia* (perfect state of health); therefore the three following are needed for the complete preservation of bodily well-being: (i) to cure sickness; (ii) to bring the body from the unstable state of health into the habitually healthy state and to keep it there; (iii) to bring the body from the habitual state of health into the perfect state and to keep it there.

Galen also wrote the following sentences, which sound quite modern:

So mighty is the influence of the spirit that many may be liberated from their diseases by joy alone, and many may become ill by misery. The best exercises are those which train not only the body, but also develop the mind.

These sentences are certainly based upon the famous dictum of the Roman philosopher Juvenal (A.D. 60-140): "Our prayers should be for a sound mind in a sound body."

The combination of both the sentences we find again in modern tendencies of physical education, namely, that with all physical exercises joy is of the utmost importance. And Galen too gave this very reasonable definition of a physical exercise:

If one is forced by a bodily movement to breathe more deeply or more quickly, then this movement is a real physical exercise for him.

The value of such a definition may be recognized if we keep in our minds the important physiological part the strength of a stimulus (maximal, minimal and optimal) plays in its effect on the body and its functions.

Galen gave us many examples of how he used physical exercises as preventive medicine. He

described special running exercises over very short distances (about thirty yards); these exercises are, as we know today, especially good for the heart development of growing children. He spoke about resistance exercises and described special preparatory exercises for dancing: movements, bending and turning of the arms, hands and fingers. It may be that this dancing was some kind of Indian temple dancing, as on the one hand we know that during this time many oriental gods were introduced into Rome, and on the other hand we learn from Galen himself that most of his medical and gymnastic work was done within the gymnasium which was connected with a temple. I may mention the fact that, by means of special lung and trunk gymnastics, Galen developed the undersized chest of a boy to normal size. Like Seneca, the Roman philosopher and educationist (A.D. 60), Galen did not approve at all of the professional athlete.

As I told you before that Galen's ideas, especially about medicine, strongly influenced the following centuries, you will understand that we do not hear many new facts concerning physical education and preventive medicine. Sometimes we find quite curious ideas about preventive medicine; for example, there were calendars with astrological dates for the regular taking of laxatives to prevent diseases. But we also know of hygienic advice to a Saxon duke with regard to food, beverages, rest and physical exercises.

Besides the influence of Galen, and through him of the old Greek medicine, Arab medicine had a great influence on the mediæval world. Especially were the books of the Arab physician Avicenna (A.D. 780-837) read very much during this time. He knew special exercises and methods for every organ, to strengthen this particular part of the body.

At the end of the mediæval period and at the beginning of the Renaissance, the recognition of the body's importance began again, and the first gymnasium as some sort of boarding school was founded by Vittorino da Feltre (A.D. 1378-1446). He called his school *Casa Jucosa* (*La Giocosa*), and in one of his writings he says:

By gymnastic exercises the body becomes developed and gains skill; the passions, not favoured by weak idleness, gain less influence, the mind becomes abler for studying and thinking.

One century later the great educationist, the Frenchman Michel de Montaigne (A.D. 1533-1593), wrote in his well-known essays:

It is not enough to strengthen the child's soul, we also have to strengthen his muscles.

And he too said most significantly about education:

It is not a body, a soul we have to educate, but a man whom we should not divide into two.

This was Plato's idea:

You should not train the one without the other, but both of them should be conducted and led as a couple of horses connected to the same shaft.

Among the English, who have the longest history of physical activities of all modern European

countries, there are many good and interesting authors writing about sports as a noble and valuable pastime, sometimes from the education standpoint, sometimes (as for instance in the reign of Henry VIII) from the military standpoint. So the physician Sir Thomas Elyot, one of the earliest advocates of swimming, wrote "The Castle of Health" about diet and exercise, and "The Governour" (1531). The latter contains a remarkable recommendation of "swymmyng". Interesting too is "Ascham's Scholemaster" (1570), by Roger Ascham, the tutor to Edward I, Lady Jane Gray and Queen Elizabeth. He gives a full list of exercises of his time, but no special comment on their hygienic value. I might mention perhaps Bacon of Verulam (1561-1626), who in his "*Sermones fideles*" recommended the cure of diseases by means of exercises. Sometimes his advice was a little too naïve, as when he thought to cure diseases of the lungs by archery, or diseases of the forehead by playing ninepins. The book of Sydenham (1624-1689) about the *exercitationes* is of medical interest only; the medical man will find here quite a number of interesting facts with regard to therapeutic exercises.

Very important indeed, and of a very widespread influence, was John Locke (1632-1704), the great English physician, educationist and philosopher. His book "Some Thoughts Concerning Education" contains much valuable advice about hygiene. He discussed hardening, clothing, bathing, sleeping *et cetera*. Moreover, he recommended physical exercises, sometimes as a kind of preventive medicine. His chief exercises were fencing, riding and dancing.

He and Montaigne had a great influence on Rousseau (1712-1778), whose chief work, "Emile" (1762), the famous treatise on education, deeply impressed the whole European continent during the nineteenth century. You all know Rousseau's "Back to Nature", and it is understandable that in his book we find many paragraphs about physical education. In spite of the fact that Rousseau did not think especially about physical education with regard to preventive medicine, I thought I should mention his name and chief work, which had so much importance for the development of all our modern physical education.

With regard to our special subject, however, you would be disappointed if I did not mention the name of the famous English physician Francis Fuller. In his book "*Medicina Gymnastica* (or Concerning the Physical Exercises for the Animal Economy or Concerning the Order Necessary for the Maintenance of the Health of Human Life)" (1705) he stated that if some of the advantages which were gained by physical exercises could be gained by drugs, nothing in the world would be more highly esteemed than such a drug. Is this not true also for today? It is to Fuller that we owe the pleasant story about an English nobleman who was travelling by carriage to some bath, where he intended to get rid of his pains and various diseases. During his travelling he had the idea of leaving his carriage and walking

beside it. When he arrived at the bath he had become completely cured.

Another book by Fuller is called "Treatise Concerning the Power of Exercises" (1740). Fuller knew the effect of exercises from his own personal experience, and described their effect as "a feeling of refreshment, gaiety and increased elasticity". He very seriously recommended physical exercises as a form of preventive medicine. (A very good book, entitled "Sports and Pastimes of the Early People of England", was published in 1804 by Strutt; "Sports and Pastimes in English Literature" (1925), edited by L. S. Wood and H. L. Burrows, gives a good collection of sport reports, stories and poems.)

During the eighteenth century we find on the Continent two great physicians who brought preventive medicine into connexion with physical exercises. In Germany, Johann Peter Frank, sometimes called "The Father of Preventive Medicine", wrote the first book about preventive medicine in its modern sense, his "System of a Medical Police" (1779), from which he got the nickname "The Medical Policeman". His book contains many hints on the hygiene of physical exercises, mostly in the direction of warnings, and sometimes he gives advice which is very reasonable indeed. However, the form in which Frank recommends the practical following of this advice is a very peculiar one:

Therefore the government is quite right in the interests of the health of the people to limit the time of dancing parties; furthermore the government will do much good to forbid unduly strenuous dances, as for example the so-called "waltz", and will forbid the parents to let their daughters go to such dangerous amusements without guardianship. And finally people should be forbidden to leave the dancing party earlier than at least half an hour after the last dance.

You see that it is not quite wrong to call Frank a "medical policeman", but as he was a very reasonable one, his book became very important for the development of the science of preventive medicine. With regard to exercises he sometimes warned a little too much.

The Frenchman Clément Joseph Tissot (1750-1826) did very much to secure the recognition of physical exercises as a most valuable help to the physician. He used the exercises in the sense of "medical gymnastics" and wrote a book entitled "Medical and Surgical Gymnastics, or Essay about the Usefulness of Movements or Various Exercises and Rest for the Cure of Diseases". (His brother, André Tissot, also a physician, dealt with the problem of whether it would be possible to give the mind its necessary freshness by regular and diligent physical exercises.)

In our historical survey we have now reached the beginning of the nineteenth century, and it may be wise to stop for a moment to think over the facts we have reported. We recognize that with regard to our subject—the relations between physical education and preventive medicine—we found quite a large amount of knowledge among the old Greeks and Romans. During the Middle Ages, however, we found no real physical education, and later on

knowledge of our subject was not very widespread. But there is no doubt that, by the help of men like Locke, Fuller and Tissot, interest in the value of exercises, interest in the welfare of the body got a new impulse, and we should expect that during the nineteenth century the relations between physical education and preventive medicine would become more and more obvious.

Unfortunately this was not so. In spite of the real development of physical education and of the great progress made by preventive medicine during the last century there has been, strangely enough, no real connexion between them. The reason seems to be that, with only a few exceptions, nobody thought to link together the educational side of the subject with its medical aspect. Certainly it would be unjust not to mention the famous Swedish gymnast Ling, whose influence, especially on England's physical education, is still felt today. He had studied both anatomy and physiology in order to develop his system, and here, to a certain extent, you can speak about tendencies in the direction of preventive medicine. At the end of the last century in Germany, too, we had some medical men who pointed out the importance of the medical side of physical education. Such, for example, were Huetpe, who wrote the first modern book about the "Hygiene of Physical Exercises", Ferdinand Schmidt, professor at the University of Bonn, who wrote one of the first medical text-books for teachers of physical culture, and the famous Virchow, a pathologist, who tried to interest the state authorities in the development of physical education. But, generally speaking, the physicians as well as the educationists went their own way without stronger contact.

Physical Education in Relation to Preventive Medicine.

I think, then, that we may finish our historical survey and turn over to the development of modern ideas about physical education in its relation to preventive medicine, a relation which, to my mind, is essential if physical education as well as medicine is to be complete. There is much reason to hope that this relation is now growing stronger and stronger. This may be due to the general idea underlying medicine as well as education during the last thirty years: the idea of the unity of body and mind, the unity of the human being. If, following Plato, Montaigne said: "It is not a body, a soul we have to educate, but a man whom we should not divide into two", then we may now happily say the same about modern medicine, replacing the word "educate" by the word "cure". This general tendency towards unity is obvious on the whole line of modern life—you could call it a reaction against mechanization and specialization. More and more our ideal again becomes the "man" and not the "specialist"; or at least we recognize that only the broad-minded, broadly educated man will be able to develop really useful specialization. And this is particularly true with regard to the educational and medical professions, which have, as no other professions, to do with the human being himself. Today

you find, therefore, that the understanding between these professions is growing more and more. The purely materialistic standpoint is being lost, and the two professions meet each other on the common platform of real biology, a biology which regards the wonder of life with piety and admiration. Therefore, they try to go more the way of synthesis than by the way of analysis. So, rightly understood, the physician becomes somewhat of an educationist, and the teacher tries to treat his pupil with the understanding, the love and the patience of a good physician.

From this standpoint we are not astonished to see that physical education of today is different from the old "physical drill" or "training", even from "formal exercises". The psychological influence becomes more obvious and important; "education of the whole man"—a term which I took from the title of a book by the well-known English author L. P. Jacks—becomes the aim of physical education. Physical education does not fulfil its duty by developing only big muscles or generally "the body". The child has to be regarded not as a copy of an adult, but as a growing personality following his own biological rules, which have to be observed very carefully and which are the subject of very important biological, medical and psychological researches. The rules of heredity, the influence of environment, the effect of exercises on the man and the woman, and especially on the boy and girl, the rules of growing, the activities of muscles—in this connexion I should like to remind you of the excellent book of Sir Colin MacKenzie, "The Actions of Muscles, including Muscle Rest and Muscle Re-Education" (1919), which is, I think, most valuable for the teacher of physical culture too—all these subjects have to be examined very carefully, and that examination must be the work of specialists. But what gives real value to the results of all these researches? Is it not the use made of them by the understanding and broad-minded "man" of whom we spoke above? And furthermore, with regard to the relations between physical education and preventive medicine, is it not quite obvious that under modern conditions these relations are so strong that neither subject could exist without the other? The tendency of modern life, the tendency towards cooperation, we find it with our subject as well. And let this be clear: this cooperation must not mean some kind of confusion of activities. On the contrary, real cooperation is possible only if each of the two cooperators knows his limits, knows where his border ends and the border of the other begins. Order and law, self-recognition and esteem of the other, the knowledge of one's own duties and the respect for the other's right, these are the real basis of freedom and cooperation, that is to say, of democracy.

Physical Education at the University of Melbourne.

Lastly, I should like to give you a short description of our new physical education course at the University of Melbourne. You may see by this example how far preventive medicine and physical

education are connected here. First let me give you a few technical facts. The course is closely attached to the Faculty of Education, having also the valuable personal support of the Dean of the Faculty, Professor G. S. Browne, whom I may call the real creator of the course. Within the Board of Studies, of which at the present time the Dean of the Faculty of Education holds the chair, there are the Dean of the Faculty of Medicine, *ex officio*, and several members of the Faculty of Medicine; furthermore, there are representatives of the general practitioners, of the surgeons and of the children's specialists, as well as experts on physical education. The course extends over two years and leads to a university diploma or certificate. Its function is to instruct teachers of physical culture for schools. The students (there are about forty at present) will come to us with matriculation as entrance qualification, and in my mind the ideal state would be that the students should have the qualification to teach some other subject too. I think that this would raise the standard of physical education in Australian schools generally.

I must speak now about the curriculum of the course. With regard to the practical side, we generally follow the lines given by the English Board of Education Syllabus for 1933. With regard to modifications, we have it carefully in mind to adapt the English system to the special Australian conditions and to add to the English system the most useful parts of the Swedish, German, American and other methods. Also sports and athletics are included, not with the aim of creating records, but as a means of creating a pleasant and living interest for the pupils. This practical part of the course is completed by games, especially team games. You may be interested to hear that fencing will become a compulsory subject for our women students. Dancing, too, we have not forgotten, with special emphasis on folk-dancing. I need not say that swimming is highly esteemed and that life-saving methods are taught. All these instructions are given not so much with the aim of making the teacher of physical culture fit himself, though we have to keep in mind that the teacher of physical culture has himself to possess a high degree of fitness, but to emphasize the problem how to teach children.

The second task of our curriculum is to give our students teaching practice. Here we are happy in obtaining the support of the Education Department and of many head-mistresses and head-masters, who afford opportunities of teaching practice within quite a number of Melbourne schools under the supervision of the school authorities and of the director of the course.

The third part of the course is the theoretical one: the lectures. During the first year we teach the following subjects. The first is the anatomical and physiological basis of physical education. I have chosen this title to avoid from the very beginning the possible danger that the student of physical education may think he is getting the same

instruction as the student of medicine. Both of them have to know exactly the borders of their activities, for the reason I have explained above. For the same reason we avoid the technical term "corrective exercises" and use the words "preventive work" and "compensatory work". I think these terms define quite clearly the task of the teacher of physical culture with regard to this part of preventive medicine. The lecture on body mechanics deals with the most important subject of posture. This lecture is completed by practical demonstrations, which I regard as essential for the subject. The necessary knowledge of first aid, of diet and of hygiene (especially school hygiene) our students get by special lectures on these various subjects. The lecture on hygiene, too, gives the student the point of view of preventive medicine. From the educational side, the theoretical instructions are obtained from lectures on the history of physical education and on the principles and methods of physical education. The whole programme of the first year is completed by excursions and by demonstrations in various schools, hospitals *et cetera*.

The second year is to be built up on the fairly broad basis of the first year. Practical instructions, lectures and demonstrations are continued and lead up to knowledge of special details. The way to the necessary cooperation with the school physician will be prepared, for instance, by lectures (with practical demonstrations) on anthropology and scientific methods of anthropometry. The science of muscle movements (kinæsiology) will be taught, and the students will have practical instructions in preventive and compensatory work. Furthermore, the students will have to attend some of the official lectures of the Faculty of Education on modern principles of education and perhaps on educational psychology.

After the second year we shall try to arrange for our students to stay in a sports camp for about a fortnight, to give them instruction in open-air living, in camping, in hiking and in the organization and administration of activities like these.

There are many other subjects our students must study, as for instance, equipment of gymnasia, management of playgrounds *et cetera*; but I need not worry you with all these details.

I think you will agree that all our subjects are essential to the modern teacher of physical culture, and that a course of two years' duration at least is necessary to acquire a sufficient qualification. There may be even the question whether two years are long enough, and indeed you find that many countries (England, Sweden, Germany, America) have three- or four-year courses. But to give you the two chief reasons for our two years' course, I should like to mention first the opinion of the famous educationist and philosopher Herbert Spencer:

It is a mistake . . . that the acquisition of knowledge is everything . . . a much more important thing is the organization of knowledge. It is not the knowledge stored up as intellectual fat which is of value, but that which is turned into intellectual muscle.

The second reason for our shorter course you will discover if you compare the different curricula. With quite a number of them you will see that there is during the third year instruction in massage and in corrective and medical gymnastics, subjects which do not belong really to the work of the teacher of physical culture, as we have pointed out several times before. So we hope that our course will be successful in producing teachers of sufficiently high qualification to carry out the work as it suggests itself to us by the example of history and by our own feeling of responsibility towards the next generation, which is inspired by the knowledge of the important relations between physical education and preventive medicine.

Keeping this in mind, I should like to finish the Charles MacKay Lecture with the words of another great man and teacher, Herbert Spencer (1820-1903), taken from his work "Education: Intellectual, Moral and Physical":

Perhaps nothing will so much hasten the time when body and mind will both be adequately cared for as a diffusion of the belief that the preservation of health is a duty. Few seem conscious that there is such a thing as physical morality. The fact is that all breaches of the laws of health are physical sins. When this is generally seen, then, and perhaps not till then, will the physical education of the young receive the attention it deserves.

PAPILLOEDEMA.¹

By ARTHUR JOYCE,
Melbourne.

THE subject of papilloedema must always be of interest, alike to the neurologist and ophthalmologist. Its early recognition is not always easy; but when developed, it is simple for all to recognize. Its distinction from optic neuritis is another matter and cannot be made, except in certain typical cases, by ophthalmoscopic examination alone.

In reading this paper, after reviewing the main points of the pathogenesis of papilloedema, I hope to bring forward clinical aspects of the subject that will promote discussion. If I digress and go into the realms of retrobulbar neuritis occasionally, I hope you will forgive me, as it is difficult to separate the two conditions.

The confusion of terms exists today much as it did years ago, when all swellings of the optic disk were regarded as inflammatory. Parsons introduced the term "papilloedema" to England in 1908, and in 1911 Paton and Holmes urged its use for œdema due to intracranial pressure alone. This distinction is still more or less generally adopted here and in England; but American and Continental writers are inclined to use papilloedema as a term to describe œdema of the disk from any cause. Traquair calls œdema due to intracranial pressure "plerocephalic œdema". This confusion will continue until some

¹Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

definite names are decided upon; but it does not matter much, so long as the two conditions so similar in appearance are kept wide apart in our minds with regard to their origin and cause. We have on the one hand a simple œdema and on the other a definite neuritis.

Pathogenesis.

The pathogenesis of papilloœdema is still unsolved. The work of Paton and Holmes has been a sheet anchor in fixing in our minds the effect of intracranial pressure on papilloœdema; but it does not explain the existence of papilloœdema in the absence of intracranial pressure. Behr's theory covers a wider field. Algernon Reese and Lillie, among other writers, support it as being the theory that explains the greatest number of conditions. It is, however, founded on the assumption of a lymph flow of the existence of which we have no proof. It would take much too long to deal with all the theories, so I shall briefly mention only a few.

Von Graefe in 1860 thought that choked disk was caused by compression of the cavernous sinus and consequent venous engorgement in the retina; but this idea was abandoned when the anastomosis between the retinal and other veins was discovered. Swift has recently advanced arguments in favour of the part played by the venous sinuses in the production of papilloœdema. Schwalbe discovered the existence of the direct communication between the arachnoid space and the sheath of the optic nerve. Schmidt-Rimpler and Manz then suggested theories that the cerebro-spinal fluid, being driven along the sheath, caused compression at the *lamina cribrosa* and choking of the papilla. Hughlings Jackson believed that changes about the tumour produced vasomotor changes and subsequent paralysis of the vessels of the optic nerve. Gowers thought it was a descending inflammation, either along the trunk of the nerve or its sheath. Leber said that the fluid in the nerve sheath was of an irritative nature, which set up inflammatory changes after entering the lymphatic spaces of the nerve. Schieck believed that the increased pressure forced the cerebro-spinal fluid into the perivascular lymph spaces and along the central vessels into the disk.

Behr's theory is that lymph from the retina and disk area normally flows through the optic nerve to the brain. By injection of the nerve he has demonstrated a system of spaces which, at the periphery of the nerve, are joined together between the nerve bundles, but which have no connexion with the intervaginal space. He holds that anything that will cause a stasis of this lymph flow will cause papilloœdema. He believes that the causes which he has tabulated may be due to intracranial pressure, compression of the nerve at the apex of the orbit, hypotony of the bulb, or an increased flow of lymph due to certain general diseases.

Paton and Holmes base their hypothesis on the examination of 60 eyes obtained from 39 patients. They say that in order to cross the vaginal space the pressure in the vein must rise parallel with

the intracranial pressure. This causes a congestion of veins and capillaries distal to this point and an excessive serous transudation in front of the *lamina cribrosa*, and "as the lymph from the disc and nerve drains mainly into the vaginal sheath its outflow will be obstructed by the raised intervaginal pressure until its pressure has risen parallel thereto. As a consequence a lymph stasis must occur. . . ."

This theory offers a very fitting explanation for the Foster Kennedy sign in frontal tumours. Pressure of the tumour causes atrophy on the same side and prevents transmission of the intracranial pressure to the vaginal sheath, whilst at the same time there is papilloœdema on the other side.

It is almost an established fact that venous congestion alone cannot cause papilloœdema, although it will cause congestion of the disk and retina. Papilloœdema is not seen as a result of thrombosis of the central retinal vein, nor does it necessarily occur when there is stasis further back. Here it might be of interest to quote a case.

CASE I.—A man, aged forty-four years, attended the out-patient clinic with an arterio-venous aneurysm of the cavernous sinus, which developed after a fall from a tram car four weeks previously. The left conjunctiva was very congested; but the fundus was normal. The left internal carotid artery was tied. Ten days later small discrete rounded patches of exudate appeared in the retina. A few days later the retinal veins were very full and tortuous, and there were more numerous patches of exudate, some of which were lying across the veins. A large hæmorrhage then occurred in the lower part of the fundus, and the disk became very congested. Small hæmorrhages appeared on the nasal side of the disk; but there was no true papilloœdema. The picture was one of intense venous congestion.

Frost, in a most interesting article on papilloœdema associated with sinus disease, says that some cases of papilloœdema associated with sinus disease can be explained on a mechanical basis. He states that in two cases of papilloœdema in association with disease of the posterior sinuses he found clinical evidence that the swelling of the disk was caused by true lymph stasis as the direct result of pressure exerted on the nerve at the apex of the orbit. However, the belief is more general that pressure on the optic nerve will usually cause atrophy. We see this frequently in tumours of the pituitary and frontal regions, and it has been found in aneurysms and sclerosis of the arteries which cause pressure on the nerve. In craniopharyngeal cysts there is usually atrophy; but in the later stages there may be œdema due to hydrocephalus. With regard to pressure on the nerve the following case is of interest.

CASE II.—A man was admitted to Prince Henry's Hospital with a cut on the forehead, received in a motor car accident. The wound was sutured, and it healed by first intention. A few days later he complained of loss of vision in the left eye. On examination, his disk and fundus appeared normal. Ordinary X ray examination of the skull showed no fracture; but examination of stereoscopic skiagraphs of the orbit disclosed a linear fracture through the upper wall of the optic foramen. This was evidently causing pressure on the optic nerve. Perception of light only was possible with the left eye.

In this case there was sufficient pressure on the nerve to cause loss of function; but there was no sign of œdema,

which, according to Behr's hypothesis, might have been expected. Unfortunately, we do not know to what extent the nerve was injured, as the patient would not remain in hospital.

Pathology.

The essential feature of papilloedema is that it is simply an oedema of the nerve head, and that it is not an inflammation. Fluid is collected between the nerve fibres, which at the disk are comparatively loose in their arrangement, and they are distended as far back as the anterior layers of the *lamina cribrosa* and bulge forwards and laterally in front of the scleral foramen. This swelling occurs first in the upper nasal section, where the fibres are thickest, and then in the lower nasal part, and finally on the temporal side, where they are thinnest. The anterior layers of the *lamina cribrosa* are separated from one another and bulged forwards by the oedema (Paton and Holmes).

The fluid does not extend very far into the retina from the disk, except to some extent along the nerve fibres. Sometimes it makes its way under the internal limiting membrane and produces vesicle formation, especially along the shorter fibres between the disk and the macula, where the vesicles form a characteristic fan-shaped figure.

The swelling of the nerve head pushes the retina away laterally or throws it into folds. Reese, in discussing peripapillary retinal detachment in the papilloedema due to hypotony, expresses the opinion that the same condition occurs in the papilloedema due to intracranial pressure, though to a less extent. He thinks that these retinal detachments explain the excessively large blind spot often associated with the papilloedema due to intracranial lesions.

The oedema and stretching and later swelling of the nerve fibres fill up the optic cup, and the transverse diameter of the disk is increased in all directions. The vessels coming from the retina must turn forwards to get round the sides of the swollen disk, and this gives the appearance of the apparent interruption of their course and the loss of the reflex on their walls seen with the ophthalmoscope.

Even in the early stage of the oedema the venous return is impeded. Therefore, hyperæmia of the disk is one of the earliest signs of papilloedema. Owing to the venous stasis the capillaries are enlarged, the retinal veins become full, and hæmorrhages due to the congestion and stretching and rupture of the small capillaries appear on the disk. Paton and Holmes found endothelial proliferation in the smaller vessels, which finally led to the occlusion of many of them, and a thickening of the adventitial coats of the larger vessels, which may later undergo a hyaline degeneration.

The nerve fibres become swollen as the oedema persists, and later sclerosis and atrophy occur, and the bluish-grey transparent appearance of the disk, which is observed at the height of the swelling, gives way to a flatter and whiter appearance. This change is shown in the fields as a peripheral contraction.

The oedema in papilloedema is practically confined to the disk; the layers of the retina beyond it are not much affected, and in this it differs very much from albuminuric retinitis. Whether it extends posteriorly beyond the cribriform plate is still a matter of dispute. Paton and Holmes say that it does not extend beyond the point where the vessels enter the intervaginal sheath.

The only sign that is at all suggestive of inflammation is the presence sometimes of a perivascular infiltration with small round cells.

Diseases Causing Papilloedema.

The most important distinguishing feature of papilloedema is the very slight interference with vision even when the oedema is extreme. The blind spot is usually enlarged; but there is very rarely a central scotoma such as is found with optic neuritis.

It is quite possible to have a great deal of oedema of the disks in disseminated sclerosis, especially if the nerve is affected just behind the *lamina cribrosa*. Parsons suggested this should be called "papillitis with an unusual amount of swelling", to distinguish the inflammatory condition from passive papilloedema. In disseminated sclerosis loss of vision is often one of the earliest signs; it occurs frequently without any change in the disk. This is true of retrobulbar neuritis from any cause. Adie found that in 32 out of 40 cases of disseminated sclerosis retrobulbar neuritis was the first symptom.

Berliner, in a very complete article, reviewed in 1935 the four so-called demyelinating diseases of the nervous system: (i) disseminated sclerosis, (ii) acute disseminated encephalomyelitis, (iii) *neuro-myelitis optica* and (iv) *encephalitis periaxialis diffusa* (Schilder's disease). He considers that it is possible for all these conditions to be variations of the one disease. In all these conditions, when the optic nerve is affected, sudden loss of vision is the outstanding feature, and the loss is usually out of all proportion to the appearance of the disk, which may be oedematous or pale or normal in appearance.

In disseminated sclerosis, which is the most common of these conditions, the vision recovers and there is very little sign left in the disk as a rule. Sometimes there is temporal pallor, or the disk may show signs of atrophy. Temporal pallor is often a misleading sign, and the ophthalmologist will not pay much attention to it unless it is quite definite, because the temporal side is normally paler than the nasal.

In disk changes due to interstitial neuritis the hyperæmia is more often in the central part of the disk.

Papilloedema which looks the same as that caused by intracranial pressure is found in certain general diseases. I do not propose to discuss these at any length; but I hope some of the neurologists will do so, because I think they include the most interesting problems with which swelling of the disk as a sign is associated. Anæmia, leuchæmia, lead poison-

ing and other toxic conditions are some of the causes.

Goldstein and Wexler, in a review of eleven cases of leuchæmia, in nine of which the fundi were examined, report that a constant feature was the presence of retinal hæmorrhages and œdema of the disks or blurring of the margins. They found swelling as high as three or four diopters in one case only.

Friedenwald and Rones reported a case of papillœdema of five diopters in both eyes in a patient whose condition had been diagnosed as *endocarditis lenta*. They attributed the papillœdema to bacterial endocarditis.

Kreibig found a case of lymphatic leuchæmia in which the symptoms of cerebral tumour were present. Examination of the fundi showed papillœdema and later on star formation at the macula, together with multiple small white retinal exudates peripherally. *Post mortem* a large subdural leuchæmic infiltrate was found in the middle cranial fossa.

In exceptional cases of chronic nephritis there may be choked disk resembling that due to intracranial pressure, without other changes in the retina (Knapp).

Favory collected five cases in which hæmorrhage into the vaginal sheath of the optic nerve occurred, accompanied by papillœdema.

Lactation optic neuritis is another recognized condition. Lillie attended a patient who had a swelling of the disk of from two to three diopters. The patient went completely blind in twenty-four hours, but later recovered under treatment.

A few years ago, teeth, tonsils and sinuses were prominent as possible causes of optic neuritis or swelling of the disks. Now it is possible they may be too much neglected. Lillie states that at the Mayo Clinic retrobulbar neuritis due to sinusitis has been observed once only. He estimates that of 500 patients with retrobulbar or optic neuritis, 60% had been operated on elsewhere for paranasal sinusitis, and that the same was true of patients with tumours of the brain. I have seen patients who recovered rapidly after the removal of infected teeth, but who later showed signs of disseminated sclerosis. These patients suffered from loss of vision with their papillœdema, and so their condition must be classed as retrobulbar neuritis.

CASE III.—One patient had an interesting history. I saw her on three occasions in consultation. She was difficult to manage and would not submit to having her visual fields measured.

I saw her on March 16, 1925. She gave the history that the vision of her right eye had become affected four days previously. Movement of the eye was painful. She had the usual appearance of papillœdema, with heaped-up rounded edges of the disk and a swelling of two diopters. The visual acuity of the right eye was $\frac{1}{12}$. The veins were full and tortuous and the arteries appeared small. The rest of the fundus was normal. The movements of the eye were normal in all directions. Her husband, who was a dentist, discovered an impacted tooth on the right side, and this was removed. The vision had improved to $\frac{1}{6}$, with correction before this was done; afterwards it

improved to $\frac{1}{4}$, and the swelling subsided. Three months later I saw her again, and this time she had a swelling of two diopters, with rounded edges and hæmorrhages of the disk on the left side. This time right antritis was discovered and dealt with, and she again recovered. I saw her again in 1928. The visual acuity of the right eye was then $\frac{1}{20}$. Her disk was a little pale and blurred on the nasal side; but there was no swelling. Her eye was painful on movement.

I did not see her after this; but I learnt that she had her tonsils and septum dealt with and again made a complete recovery. At no time was there any evidence of involvement of the central nervous system. Dr. M. D. Silberberg, who examined her, could find nothing abnormal. I think she may prove in the end to be suffering from disseminated sclerosis.

Local disturbance in the orbit can cause œdema of the disk; but here again visual acuity is usually reduced and the nerve itself affected.

CASE IV.—On June 1, 1934, a male, aged fifty-six years, whom I saw with Dr. Frank Niall, complained that three days before he had noticed failing vision in the left eye, and that movement of the eye was painful. The visual acuity was $\frac{1}{20}$. The upper and lower lids were a little swollen, and there was slight proptosis. The disk was a little swollen, and there were a few spots of exudate and a small hæmorrhage at the macula. He had a central scotoma. In six days the vision rapidly dropped to perception of hand movements, and the swelling of the disk increased.

He had tenderness on pressure against the roof of the orbit. The eye movements were restricted. Although his blood did not react to the Wassermann test, he was given potassium iodide and pills of tartrate of mercury, and he improved rapidly. His visual acuity increased to $\frac{1}{4}$. On two occasions, owing to gastritis, his treatment had to be stopped, and on each occasion his sight became poor again and the pain returned; but he improved again immediately his treatment was restored. On August 30, 1934, his visual acuity was $\frac{1}{4}$. His visual fields were full; but his left disk was pale.

This was a case I think of gumma of the orbit, and the œdema of the disk differed from true papillœdema in the loss of visual acuity, the degree of swelling, the early involvement of the retina and the rapid return of vision with the reduction of swelling.

Increased intracranial pressure due to cerebral tumour is by far the most common cause of bilateral papillœdema.

Halliburton has stated that "CO₂ and extract of brain substance are two of the greatest stimulants for the secretion of cerebro-spinal fluid. These extracts act directly on the secretory cells of the choroid gland as a hormone."

Professor Mills suggests that in rapidly growing destructive tumours of the brain more extract of brain tissue is set free and so causes an increased amount of cerebro-spinal fluid. He also suggests that toxic substances from local infections in the throat, lungs, spinal cord and other places, carried by the blood stream to the chorioid plexus, act as stimulants to this gland and so cause an increase of fluid and increased intracranial pressure. How true this may be we do not know. It is certainly true that there may be a very much higher intracranial pressure and more pronounced papillœdema with a comparatively small tumour than there is sometimes with a large, slowly growing tumour.

It is well known that subtentorial tumours are more frequently associated with papilloedema than those situated above the tentorium. On this account Sachs stated that he never performed lumbar puncture in the presence of papilloedema unless it was absolutely necessary for diagnostic reasons, because the withdrawal of spinal fluid might cause the cerebellar tonsil to slide through the foramen magnum.

When the intracranial pressure is increased the cerebro-spinal fluid is also found to be increased. When the aqueduct of Sylvius is blocked by compression the pressure of cerebro-spinal fluid may not be increased. The effect of the site of the tumour on papilloedema I shall leave to the neurologists.

Disturbance of vision is a not uncommon symptom in tumour of the brain. The loss of vision depends mainly on the situation of the tumour, and it varies from a slight vague disturbance in the vision to actual loss of visual fields. But sometimes there is no loss of vision at all and the patient may consult the oculist on account of headache. In such a case the discovery of papilloedema may be the first sign of tumour. An enlargement of the blind spot is the normal finding, and as the oedema spreads outwards, this may increase in size. Visual acuity is not as a rule affected unless the oedema goes on increasing for some time.

Apart from regional defects due to the situation of the tumour the peripheral fields remain full till atrophy starts and a peripheral contraction takes place. This is the usual change in the field due to papilloedema. Hemianopia occurs according to the position of the tumour; but bitemporal hemianopia does not occur, because tumours at the chiasma usually cause atrophy. Apart from these defects, loss of vision due to papilloedema itself is rare. The visual acuity remains good in spite of the presence of great oedema.

As long as the central vision is good and the peripheral fields are full, operation in the absence of a positive diagnosis can be deferred. There are cases in which recovery takes place, and no explanation can be found for it. If vision begins to fail and the peripheral fields become contracted the need of operation is more urgent. Uhthoff found that spontaneous recovery took place in 5% of cases in which choked disk was accompanied by all the symptoms that indicated tumour of the brain.

Papilloedema may subside or decrease or remain the same just after operation. I have seen it increase even though the vision improved. Uhthoff says that even if papilloedema occurs only after operation it must not always be looked upon as an unfavourable sign.

Unilateral papilloedema is rare in cerebral tumours, and it is of no definite localizing value when it is present. It sometimes develops on one side earlier than the other. Uhthoff found that unilateral choked disk was more frequently on the same side in cerebral abscess than in tumour.

There are patients with papilloedema for which no definite explanation can be discovered, and at the present time I have two such patients, a summary of whose notes I should like to give.

CASE V.—A female, A.H., aged seven years, was seen on February 28, 1930. She had been suffering from headache and vomiting, and on that day had returned from school saying she could not see. On examination it was found that the child apparently could not see anything. The right pupil was dilated and would not react to light. She had papilloedema of each disk of about three diopters. She was taken to a public hospital, where her condition was diagnosed as cerebral tumour. Decompression was done on each side. At operation the cerebro-spinal fluid was not under increased tension and no abnormality was detected. A week after the operation her vision began to return and her pupil reacted to light.

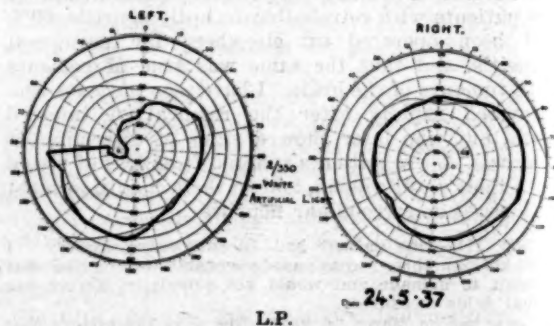
She was discharged on April 1, 1930, with good vision in each eye and apparently well. No abnormality was found at neurological examination. There was no reaction to the Wassermann test, and the cerebro-spinal fluid was normal. The blood urea content was normal. General examination revealed no abnormality. She had had measles two months before.

Since her discharge from hospital she has had no trouble. Her visual acuity now is $\frac{5}{6}$ in each eye.

This seems to be an example of retrobulbar neuritis, and the sudden loss of vision in this instance was an indication against rather than for decompression. The patient would probably have recovered just as completely without any operation. There was certainly definite loss of conduction, which is not usual with papilloedema due to tumour.

CASE VI.—L.P., a female, aged nineteen years, was seen on May 24, 1937, complaining of mist in front of the left eye. The disturbance had existed for three days. There was an indefinite history of headaches for eighteen months. Four weeks before she had had "influenza" and had been away from work for ten days. She had had frontal headache for a few days.

Her visual acuity, with correction, was $\frac{5}{6}$ (right eye) and $\frac{5}{6}$, partly (left eye). There was an upper temporal loss in the visual field of the left eye, extending into an enlarged blind spot. There was early papilloedema of the right eye, measuring 1.5 diopters. In the left eye there was papilloedema of four diopters.



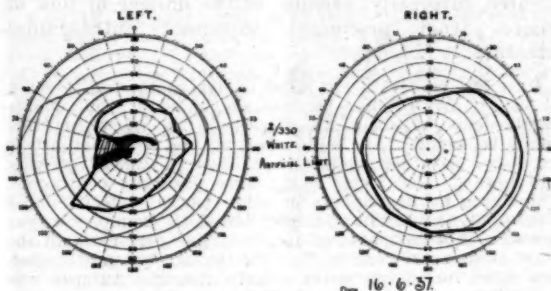
Dr. Mostyn Powell reported a Babinski reflex on the left side. The cerebro-spinal fluid was normal.

X ray examination revealed no abnormality beyond increase of the digital markings.

Recently she had had pain about the left ear. She was also examined thoroughly by Dr. Graeme Robertson and Dr. Frank Morgan, and the final result was that nothing definite was discovered. Ventricular puncture showed that there was no increased intracranial pressure. Ventriculography showed normal ventricles.

Her left pupil did not react so readily to light as her right. Both reacted to accommodation.

There are now atrophic changes in the left disk and there are contraction of the periphery of her visual fields and extension of her defect about the blind spot almost to the centre. The visual acuity of the right eye is $\frac{1}{2}$, and of the left $\frac{1}{6}$. With her left eye she can read Jaeger I.



L.P.

This is a very puzzling case. At one time it looked as though she might have cerebral tumour; but the evidence is against that now. If she had retrobulbar neuritis or papillitis one would expect an early and greater loss of vision and a central scotoma. Up to the present we have not been able to find a satisfactory explanation for her papillœdema.

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PAPILLŒDEMA.¹

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THE invention of the self-illuminating ophthalmoscope has rendered the inspection of the retina easy in the great majority of cases. The use of this instrument should be insisted upon in the training of medical students. In every general medical examination the physician should use his ophthalmoscope as a routine. However, it is in suspected or obvious disease of the nervous system that the examination of the optic disks and eye grounds has its greatest value, and the discovery of papillœdema or its absence may be of supreme importance in diagnosis.

The presence of bilateral papillœdema may be taken as evidence of increased intracranial pressure, that is, its cause is purely mechanical. Its importance is twofold: first, if unrelieved it will probably lead to secondary atrophy and blindness; secondly, it may indicate a condition which may in itself prove fatal.

The optic disk may be swollen, either from inflammatory exudation or from interference with its drainage along the optic sheath. It is necessary, therefore, to distinguish between optic neuritis and choked disk. This may be difficult, sometimes impossible. In optic neuritis the disk is abnormally red and clouded. The edges are blurred and slightly elevated. The retinal arteries are but slightly affected; but the veins are wide and tortuous. There is œdema of the retina around the disk; but hemorrhages are rare in the early stage.

There may be sclerotic changes in the arteries of the fundus in albuminuric retinitis due to chronic nephritis. Central scotomata are present in many cases, and visual acuity is diminished out of proportion to the visible damage. (Bailey, "Intracranial Tumours", page 388).

In early papillœdema, although the disk is reddened, many dilated capillaries are visible upon its surface. The boundaries are obscured and elevated. The arteries tend to curl over the margins of the disk, and the veins are engorged. The physiological cup is filled. Vision is seldom impaired to any great extent, and there are no scotomata.

The appearance of more advanced choking of the disk I need not dwell upon. The swelling may reach six or seven diopters. In spite of general œdema of the retina and even hemorrhages, vision may remain almost intact for a long time after swelling has commenced. The visual fields are first gradually restricted and the blind spots enlarge. Transient darkening of the vision may occur, especially on change of posture. Finally vision may be rapidly lost. At this stage secondary atrophy may have set in or will inevitably occur later.

¹Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

The diagnosis between optic neuritis and papilloedema is, of course, aided by the discovery of some constitutional cause for the former. Nephritis is the commonest. It is to be borne in mind that it is only in severe nephritis that retinitis occurs, when the urinary and cardio-vascular and uræmic signs are present. It is doubtful whether albuminuric retinitis can occur in the absence of a significant rise of blood pressure. In the nephritic cases there are usually extensive hæmorrhages and serous exudates and œdema; the last may completely obscure the disk margins.

Diabetes, syphilis and tuberculosis may all cause retinitis; but in each case the appearance of the retina is not that of true choked disk and the associated disease gives the clue to the diagnosis; the same is also true of the retinal changes which may be caused by pernicious anemia, leuchæmia and purpura.

In high blood pressure with arteriosclerosis, with or without chronic renal change, there may be difficulty, especially if equivocal cerebral symptoms are present, since a patient may also have an intracranial tumour. In such cases the arterial changes, such as the "silver wire" appearance and variations in calibre, and the extensive distribution, especially in the macular region and towards the periphery, of hæmorrhages, stellate spots and woolly patches, are significant. Still, ophthalmoscopic diagnosis may be made very difficult if œdema has caused elevation of the disk, as it may to the extent of several diopters.

Having decided that papilloedema is undoubtedly present, we may conclude that increased intracranial pressure exists, and further, that it has been in existence for some time. Just how long a period is necessary before evidence is to be found in the eye ground probably depends on the degree of pressure.

Intracranial Tumour.

Although several morbid conditions within the cranium may cause papilloedema, newgrowth is by far the commonest and should always be suspected in the absence of evidence to the contrary. Even when such evidence is apparent, it should be carefully weighed before its value is decided on. Thus a positive Wassermann reaction of the blood should not cause undue delay with anti-luetic treatment if such a measure is not soon followed by the relief of signs and symptoms of increased intracranial pressure.

CASE I.—Some eight years ago I saw a woman, aged thirty years, who for some months had suffered from headache and occasional vomiting. Recently her vision had been failing. Examination showed that secondary optic atrophy had begun. Four months before the consultation her medical adviser had the Wassermann reaction of the blood tested. This was said to be positive, and a course of anti-syphilitic treatment was carried out. In spite of this she had become gradually worse, and finally her sight deteriorated. A decompressive operation, followed by deep X ray therapy, saved her life, and she is now in good health, but totally blind.

I have reason to believe that the blood examination gave an erroneous result; but even if it had been correct, the patient should have been operated upon. As Victor Horsley pointed out many years ago, a gumma of the brain which does not yield to treatment should be regarded as a tumour to be treated surgically, because of the danger of loss of vision from prolonged increased intracranial pressure.

CASE II.—In 1912 a girl, aged twelve years, was referred to me by Dr. Fischer because she suffered from double papilloedema of about 2.5 diopters. No cause for this could be found. In 1919, after my return from active service, I saw her again, when secondary optic atrophy had begun. Her visual fields were generally contracted. There was no hemianopia or other partial defect, simply a general contraction. Slight left-sided hemiplegia was present. A decompressive operation was performed in the right subtemporal region; but the tumour was not located. She lived for about twelve months longer. Autopsy was not permitted. In her case the papilloedema preceded neurological localizing signs by about six years.

The actual mechanism by which a tumour causes papilloedema is not altogether clear; for apparently tumours in the same situation do not have the same invariable results in this respect. Thus it is well known that tumours of the posterior fossa are apt to cause papilloedema in the great majority of cases. Certainly it must be unusual for an acoustic tumour the size of a pigeon's egg to be present without papilloedema, yet in a case I saw with Sir Henry Newland this condition existed. The patient was a woman, aged forty-two years. Symptoms had been present for between three and four years. Probably the slow growth of the tumour permitted compensatory adjustments to occur in the circulatory mechanism of the cerebro-spinal fluid.

Following hæmorrhage into a tumour or acute cerebral œdema around it, choked disk may rapidly develop and clarify an obscure diagnosis. Case III is an example.

CASE III.—A previously healthy man, aged forty-three years, had a sudden disturbance of vision while driving his car. Everything seemed to move rapidly from side to side and he saw glassy objects before his eyes. He felt giddy and weak for about ten minutes, but soon recovered. One and a half hours later he felt giddy again and became unconscious and had an epileptic fit. This was followed by left hemiparesis, lasting thirty-six hours, with conjugate deviation of the eyes to the right. After a week in bed he felt quite well.

On examination there were neurological signs of slight involvement of the left pyramidal tract and almost complete left homonymous hemianopia. At this stage there was no papilloedema and the pressure of the cerebro-spinal fluid was 120 millimetres of water. Ventriculography showed poor filling of the posterior horn and body of the right lateral ventricle.

Six weeks later the optic disks were intensely swollen to six diopters and retinal hæmorrhages and exudations were present. He had a large tumour of the right parietal and occipital lobe which could be only partially removed. It was a *glioblastoma multiforme*.

The interpretation of the initial epileptiform seizure is, I believe, that it was due to some sudden vascular disturbance, either hæmorrhagic or from acute œdema, which left behind the permanent left hemianopia and more transient hemiplegia. It had not the character of a more simple irritative epileptiform attack, so often the first symptom of a cerebral tumour.

Causes other than Tumour.

Apart from tumour, other causes of papilloedema, though far less frequent, should be remembered. As examples I shall mention a few seen in recent years. In chronic basal meningitis, for example, the disks may be intensely oedematous.

CASE IV.—A young man, aged twenty years, suffered for some weeks with intense headaches, vomiting and epileptiform seizures. He was slightly hemiplegic. Examination of the eyes showed intense papilloedema. He died following craniotomy, at which a tumour was not found. *Post mortem* examination revealed matting and thickening of the basal meninges and a slight degree of internal hydrocephalus. Microscopically chronic inflammation of the soft meninges, neither tuberculous nor syphilitic, was found.

CASE V.—A man, aged thirty years, who had previously had good health, began to suffer from severe headaches, from which he sought relief. The significant signs were double papilloedema of between 2.5 and 3.0 diopters and very slight left hemiplegia (weakness of the left side of the face and slight increase of the left deep reflexes with lessened left abdominal reflexes). The cerebro-spinal fluid was under a pressure of 240 millimetres of water when the patient was horizontal. It contained a normal number of cells (lymphocytes) and a greatly increased quantity of globulin. Neither the cerebro-spinal fluid nor the blood reacted to the Wassermann test, and the Lange gold curve was normal. The patient's temperature was normal. Because of the papilloedema a left subtemporal craniotomy was performed by Dr. Leonard Lindon. The brain was extensively explored, but no tumour was found. After the operation the papilloedema rapidly subsided. This case belongs to the class which was formerly unscientifically but conveniently called pseudo-tumour cerebri. Arachnoiditis or aseptic serous meningitis, which one has seen occasionally, and which Dr. Weston Hurst informs me is probably due to a virus, has been recognized in recent years. I suppose the slight changes in the cerebro-spinal fluid should have caused us to wait longer before operating, though the improvement which followed was striking.

Following subarachnoid hæmorrhage, papilloedema may occur owing to the presence of blood clot at the base of the brain filling the cisterns and interfering with the return of the cerebro-spinal fluid towards the vertex.

CASE VI.—Such a condition was observed in a man, aged forty years, in whom intense papilloedema developed ten days after a subarachnoid hæmorrhage. Examination of the brain after death a week later showed a flat cake of blood clot, filling the subarachnoid spaces at the base of the brain in both middle and posterior fossæ.

In abscess of the brain papilloedema is an inconstant sign, depending on the size, situation and rate of increase in the size of the abscess, as well as upon the degree of inflammatory oedema surrounding it. The presence of papilloedema may be of value in confirming or strengthening a diagnosis, but its absence is not of much diagnostic significance. Its rate of development is of importance.

In the later stages of tuberculous meningitis choked disk is not infrequently found; but by that time the diagnosis of the cause is seldom doubtful.

Among the rare causes of papilloedema is Paget's disease.

CASE VII.—Miss B., a hospital matron, aged forty-two years, had suffered from headache and giddiness for some months. When examined in February, 1915, she had ataxy of cerebellar type. Pronounced bilateral choked disk

was present. Examination of the skull showed Paget's disease. An operation for decompression was performed by Dr. Cudmore; this was followed by relief from the symptoms of increased intracranial pressure. Microscopic examination of the removed bone showed *osteitis deformans*. In this case the skull was apparently the only site of the condition. The actual mechanism by which increased pressure was caused is not clear.

I have not touched on the question of whether the fact that one disk is more swollen than its fellow has any diagnostic significance. The matter was debated years ago between Sir Victor Horsley and Sir William Gowers, but is seldom revived in these days, and it is difficult to see, in view of the accepted pathology of papilloedema, how such a difference can have any diagnostic value.

Discussing the question of a different degree of swelling in the disks, Leslie Paton (*The Canadian Medical Association Journal*, Volume XXXIV, 1936, page 555) quotes Walter Parker's explanation that the inequality of the swelling is caused by unequal intraocular tension on the two sides. He says that another factor may be some difference in the tissue construction of the two disks.

Paton, in the same address, describes the condition in which one optic nerve may be compressed by a tumour of the anterior end of the temporo-sphenoidal lobe or of the under-surface of the frontal lobe, with resultant homolateral optic atrophy, whilst on the opposite side increased intracranial pressure causes papilloedema.

Monocular papilloedema is rare and the literature on the subject is scanty.

CASE VIII.—Last year I saw a man, aged twenty years, who suffered from aleuchæmic lymphoid leuchæmia. He had an intense swelling of the right optic disk. This persisted until his death.

When such a condition is recognized a complete general examination should be made. (E. Hill, "Papilloedema and Intracranial Complications of Leukemia", *American Journal of Ophthalmology*, Volume XV, 1932, page 1127.)

Summary of Causes.

From the observations which I have put before you the following conclusions seem to emerge.

1. Papilloedema may for years be the only diagnostic sign of intracranial tumour.

2. Although it is found in the great majority of intracranial newgrowths, some such newgrowths may attain considerable size even in the posterior fossa without causing choked disk.

3. Chronic basal non-purulent meningitis, so-called aseptic meningitis or arachnoiditis, internal hydrocephalus or syphilitic meningitis may produce symptoms and signs very closely simulating those of an intracranial tumour, including the production of intense papilloedema.

4. Unilateral papilloedema may be caused by a disease of the blood (leuchæmia). In the days when chlorosis was common papilloedema is said to have been one of its recognized complications (Collier).

5. Papilloedema may develop rapidly after subarachnoid hæmorrhage and also quickly follow hæmorrhage into a tumour or œdema around it.

It is essential in every case of papilloedema to make a very careful examination, bearing in mind all its possible causes. Lead poisoning is a cause; but I have had no personal experience of such a case.

Prognosis.

Whilst preparing this paper I read the report (*The Lancet*, May 8, 1937, page 110) of Dr. Gordon Holmes's address on prognosis in papilloedema. He points out that the view that papilloedema is an immediate danger to vision is erroneous. In œdema of the nerve head there is for a time little damage either to the structure or function of the nerve elements, though these may be strangled and destroyed by the growth of interstitial tissue when the œdema subsides. In the latter stage recovery of vision cannot occur.

Since the cause of the œdema is increased intracranial pressure, relief of tension will relieve the œdema and so remove the threat of blindness if the secondary phase has not begun.

Immediate operation is not always advisable. Removal of the tumour may be impossible, especially if it be a large infiltrating glioma. In such a case operation may reduce the duration and utility of life, unless it be a simple decompression. Operation itself may be fatal. In the presence of choked disk how long operation may be delayed is a question not easy to answer. The œdema itself is compatible with good vision. Sometimes it subsides and disappears. Some of these latter cases seem to be due to internal hydrocephalus; others may be due to obsolescent gummata or tuberculomata or even to a degenerating glioma. Serous aseptic meningitis or arachnoiditis is another cause. In most cases, however, decompression is necessary. Rapid increase of swelling indicates urgency. A swelling of four or five diopters is a warning against undue delay; so is great engorgement of the retinal veins, with hæmorrhage on the surface of the swollen disk. Narrowing of the arteries in the disk indicates dangerous constriction of their channels, leading to ischæmia and atrophy of the nerve. Frequent examinations should be made. Transient amblyopia is often the forerunner of blindness. Decompressive craniotomy usually causes subsidence of the papilloedema in two to four weeks, and if secondary atrophy has not begun vision may be saved and the patient's life prolonged even if the tumour should not be removed; for in some cases deep X ray therapy may cause the permanent disappearance of the tumour, while in others there may be a recurrence only after several years.

It is perhaps unnecessary to say that much swelling of the disks, since it indicates a considerable increase in intracranial pressure, should be a warning against the withdrawal of more than a few (about five) cubic centimetres of cerebro-spinal fluid by lumbar or cisternal puncture; in addition,

the diagnostic procedure of encephalography is contraindicated. If ventriculography is undertaken the surgeon should be prepared to operate at once, since drainage of the ventricles may give rise to a dangerous reactive cerebral œdema.

When I prepared these introductory observations I avoided as far as possible an academic presentation and based them on a few cases which I had myself seen and which at the time had given much cause for anxiety and afterwards reason for reflection, since I felt that a record of personal experience would be the most likely to promote a discussion.

INFANTILE ECZEMA.¹

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The term "infantile eczema" covers a number of conditions. For the purpose of this paper infantile eczema is of two kinds: allergic (beginning on the face) and infective (beginning in the scalp).

Causes.

Predisposing Causes.

In the allergic type the hereditary factor is of great importance; in 60% to 70% of cases there is a family history of allergy of some kind. Contributory aggravating hereditary conditions may be ichthyosis and metabolic idiosyncrasies. Other predisposing causes are infection, especially in the scalp type, and dietary factors, of which I shall have more to say later.

Exciting Causes.

Factors in the diet are an exciting as well as a predisposing cause of eczema in that a child already sensitized to a particular foodstuff may become affected on the ingestion of that food.

The local causes may be contact with irritants, such as woollen clothing, sun, wind, and chemicals as those in crude soap, camphorated oil *et cetera*. Trauma, especially scratching, may precipitate infantile eczema. Another cause is infection, which may follow scratching or may occur especially in moist skin folds. In the scalp type of eczema dandruff in the infant or his attendants is thought to play a part.

The hereditary factor causing infantile eczema has been looked at from two aspects.

Czerny described an hereditary condition, the exudative diathesis, shown by the occurrence of eczema, asthma, hay fever, migraine, urticaria *et cetera*. He regarded it as due to a constitutional inability to deal with excess in foods, or indeed to meet any kind of stress, for example, excitement.

¹Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

When the limit of tolerance is overstepped the characteristic signs of disease appear. Von Pirquet, on the other hand, gave us the foundations of our present-day conception of allergy, though he applied it only to tuberculosis. Allergy can be regarded as an inheritable state in which, owing either to peculiarities in the make-up of the tissues or of the body fluids, hypersensitivity to substances is easily acquired. When this hypersensitivity exists the ingestion of or contact with the offending substance leads to the development of symptoms of an allergic nature.

It is obvious that these observers were viewing the same problem from different angles, and where their views are not identical they are complementary.

From whatever angle we view this problem diet is of great importance. We have all seen cases in which infantile eczema has cleared up on the elimination of some foodstuff, such as egg or chocolate, from the mother's or child's diet, especially if it has been taken in excess. In many cases, however, there is no such dramatic improvement, and we are faced with the difficulty of deciding whether there is a food hypersensitivity which is causative, or whether, as Czerny's diathesis theory suggests, there is an inability on the part of the child to deal with food presented to it. The total intake may be too much, or there may be some fault in balance, or some element, fat for example, may not be well tolerated. Hansen's work on the lowered incidence of unsaturated fatty acids in the serum of eczematous infants may, if substantiated, give a greater degree of definition to this suggested abnormality of fat metabolism. His work was founded on the observation that eczematous rats taking a fat-free diet were relieved by the administration of raw linseed oil, and he has reported success in dealing with eczematous infants by this means.

Local causes are most important in the scalp or infective type, or in allergic cases, when the stage is set for the development of eczema. Scratching especially, due to pruritus, damages the skin, lowers its resistance, introduces infection and extends the affected area.

The infective (scalp) type may be complicated by an allergic tendency. In a clear-cut case one would expect dietary considerations to be all-important in the facial and less important, except in the ordinary way, in the scalp type.

Symptoms.

The Facial Type.

In the facial type the condition appears after the second month and usually during the first year. The chin, forehead and cheeks are often affected. The rash may be weeping and crusted or dry and scaly. The pruritus is intense. Soon after the onset the rash may extend and involve the entire surface of the body except the palms and soles. In other cases only the extensor surfaces of the limbs and the flexures are affected. During exacerbations, which are common and may be due to some non-specific infection, such as a common cold or to

teething *et cetera*, the rash may become generalized. If the child is allowed to scratch, infection may complicate the picture. After the age of two years the rash is less extensive. It affects the flexures and there may be scattered patches. There may be a recurrence of the eruption at adolescence.

Other signs of allergy may appear even during the first few months; asthma and bronchitis are often met with. The type of asthma in very young children may be unusual, resembling profound anaphylactic shock.

It has been stated that sensitization to foods may be demonstrated in two-thirds or more of the cases, and it is found that sensitivity to other substances may be present. The inhalants, namely, feathers, silk, dust *et cetera*, may cause sensitization, and later still pollens may be implicated. It is of interest to note that this sensitization, even to fabrics such as silk, occurs by inhalation, not by contact.

Respiratory and other infections may cause disappearance of the rash, associated with severe dehydration and sometimes sudden death. The sudden death of young allergic infants is a well-known occurrence; Waldbott suggests that it is due to anaphylactic shock, which causes oedema of the lung. His observations in two cases caused him to reflect that "thymic death" might be of the nature of anaphylactic shock, and that a number of infants dying suddenly without obvious cause might show signs of pulmonary oedema if these were looked for. In this connexion it is interesting to note that Czerny regards the lymphatic diathesis, in which sudden death is known to occur, as a more severe variation of the exudative diathesis.

The Infective Type.

The infective type begins in the scalp. It is manifested by a weeping, crusted surface, and often raw patches behind the ears and in the skin folds. On these raw surfaces streptococci and staphylococci flourish. In such cases eczema is regarded as due to infection and not to food allergy, although the two conditions may coexist.

Diagnosis.

It is plain from the foregoing that types of eczema may occur singly or they may coexist. If the facial origin is apparent and there is a family history of allergy, and if there is an intestinal disturbance at the onset, an attempt must be made to find the offending dietary factor.

If the child is breast-fed, ask the mother whether during pregnancy she had a longing for any food, and ask if that particular food is still being taken. See that there are no obvious faults in the quantity or balance of her diet. If the child is artificially fed, ask: (i) what food he has been taking (is it a well balanced diet?); (ii) whether the cow's milk has been boiled; (iii) what quantities of food he has been given; (iv) at what stage of feeding his rash developed. It is important to ascertain what digestive symptoms have occurred. Skin tests for sensitivity may be done. Elimination diets may be

practised. Various other investigations, such as blood tests, may be carried out.

If the mother has eaten unduly of any particular food, its removal from her dietary may relieve the child of its eczema. The food may be of any kind; but egg is the most common sensitizing agent, and it is worth while deleting this even apart from definite indications.

Elimination diets which may be used for the child are: cow's milk, boiled, evaporated or acidified, and vegetable milks, such as almond lac and soya bean milk (the last two contain no cow's milk). Dramatic results are not usually experienced, and two weeks may elapse before the full effect is apparent. This is one of the difficulties in finding the offending substance by elimination diets given to the child.

If the skin is in a sufficiently healthy state to allow of testing, positive results may give valuable help. The absence of reaction is not dependable, as it is well known that children may fail to react to a skin test and yet react specifically to the food. Skin tests may be done by: (i) the scratch or prick method; (ii) intradermal injection; or (iii) the patch method. In the case of breast-fed infants all the items in the mother's diet may be used, and inhalants and pollens also if necessary. In a positive reaction there should be erythema and pseudopodia.

Eosinophilia is in favour of an allergic diathesis. The extent of the eosinophilia has been found to vary with the type of antigen rather than with the degree of allergic manifestation; its rise and fall in a given case are apparently not significant in regard to prognosis.

Lymphocytosis, leucopenia, increased coagulation time and altered carbohydrate metabolism are changes which are said to occur in eczema; but these findings cannot be used in diagnosis, as their constancy and significance are not proven.

Antibodies in the serum may be detected in the laboratory animal but are not easily demonstrable in the human subject.

Prognosis.

The allergic child is subject to serious accidents and infections, which may lead to severe illness or death, and in the event of failure to discover and avoid the cause it may be difficult to cure the condition. The allergic child may all his life be subject to severe manifestations. On the other hand, many cases are known in which recovery is complete and in which sequelæ do not occur.

In the infective type there is apt to be a lowered resistance or sensitivity to septic organisms; this may lead to minor chronic infections. The prognosis as far as the rash is concerned is, however, better than in the allergic type.

Treatment.

Prevention.

We know that hypersensitization to certain substances, notably proteins, may be induced by

parenteral injection. For the most part food is digested before absorption, proteins, for example, being changed into peptones; and it may be wondered why sensitivity should develop when food is introduced by way of the stomach. A series of experiments by B. Ratner and H. L. Gruehl proves that during digestion absorption of unchanged protein normally takes place, so that if the other factors favouring allergy are present it is not difficult to see how a special sensitivity to a food may arise. The absorption of soluble milk protein unchanged is a normal and physiological phenomenon in infants and children, as in adults. The injection of pure proteins derived from milk will sensitize animals to each, providing the initial dose is adequate; in a similar way adequate injections of whole raw milk and evaporated milk will sensitize to all the protein elements. When animals are fed with raw milk or dried milk or raw egg, more than 50% become sensitized; but evaporated milk, milk boiled for four hours, and well-cooked egg have very little capacity for producing sensitization when given by mouth.

The difference, therefore, between injecting such substances and giving them orally must be accounted for by the increased digestibility of the cooked proteins and their lessened liability to absorption in their original state.

In addition, it is known that acidification of the evaporated milk still further diminishes its sensitizing power. Working along these lines, Bray evolved his food known as "Allergilac". The prolonged heating which plays an essential part in the preparation of evaporated and boiled milk and "Allergilac", causes a change in the soluble protein, which apparently does not reach denaturation, but is rather in the nature of an agglutination.

In prevention, the diet of all mothers during gestation should be well balanced and adequate, and all babies should be breast fed as far as possible, though this is not necessarily a preventive measure. A careful watch should be kept for digestive symptoms in the baby, especially in families with hereditary allergy or an exudative diathesis. In this connexion the danger of raw milk and of albumen water should be realized. The use of the latter in diarrhoea has largely died out, but survives here and there. It should be avoided, as absorption of unchanged protein is even more likely when the digestive tract is disturbed. Whey also is less used than formerly; if given during periods of intestinal upset it should be well boiled. The use of citrate of soda to make the casein soluble may be harmful. Excess of food is undesirable, and if any fat intolerance is suspected there should be elimination either of fat or of volatile fatty acids.

Other preventive measures are the avoidance of external chemical irritants and woollen clothing and of over-clothing; careful management of bathing and drying the skin is necessary, and undue exposure to sun and wind should be avoided.

Curative Treatment.

When one begins to treat a patient suffering from eczema in the acute stage, the first thing to do is to put the child to bed and prevent scratching. This may be attempted in various ways. The arms and legs are tied to the cot or splinted, and perhaps a drawsheet binder may be useful. It is impossible entirely to prevent friction to the face; for while the child can move his head, he can rub it on the pillow. Face masks are sometimes a help. When fed the child is taken out of bed and he can then be rolled in a sheet.

If the rash is at the crusting stage starch poultices are helpful, and crude coal tar in various dilutions has been used in most cases at some stage. Paraffin, Lassar's paste, ichthyol and other ointments, "Elastoplast", Unna's paste, X rays and many other preparations have all been tried with a varying degree of success. The avoidance of soap and water is usual; olive oil, if not a sensitizing agent, may be used in cleansing.

Another important point in treatment is the management of the child from the psychological point of view. Restlessness, due to pruritus and the coercion which has to be exercised, must be allayed as far as possible. This may be done by sedative applications and by sedative drugs when required.

The mother or attendant should help the child by preserving a calm, reassuring, kindly attitude; the over-worrying, pitying mother soon produces an unhappy self-pitying child. If the mother is of such a type the child should be removed to a hospital or put under the care of a suitable nurse. Children of exudative diathesis or allergic inheritance are peculiarly susceptible to emotional influences and require an atmosphere of reassurance and serenity. This is easy to prescribe but difficult to provide.

I come now to the subject of diet in treatment, and it seems clear that eggs are usually harmful and should be eliminated. In a few cases it has been shown that the condition has improved on the inclusion of fat in the dietary, so that no absolute rule can be made as to milk fat. Probably the most important point is to give a food containing all essential factors and, as far as may be, well balanced.

In the treatment of breast-fed babies regulation of the mother's diet may prove successful, and lucky is the medical attendant who encounters such good fortune. An early transition of the infant's diet, whether breast-fed or artificially fed, into the next stage—vegetables, meats, soup and solid elements—is often found beneficial. It may be due to this mixed diet that children as they approach two years of age show less violent evidence of eczema, the variations in the food providing necessary variety and no doubt throwing less constant stress on the metabolic processes.

In the artificially fed infant the removal of cream or some other constituent, such as a cereal, from the diet, the use of boiled or evaporated milk, acidified or otherwise, the use of a butter flour mixture or of vegetable milks—soya bean milk or almond

lac—may solve the problem, and an early change to a varied diet, consisting of vegetables *et cetera*, may be made. One point in the composition of the flour ball as used in the butter-flour mixture has interested me. The flour used is prepared by eight hours' boiling and two hours' baking. Professor Mitchell, of the Adelaide University, undertook for me an investigation into the changes produced by this prolonged treatment. He found that the starch was quite unaffected, and his conclusion was that the increased digestibility which had been observed was due to a change in the protein. I think, therefore, that in all probability, even in cases of wheat sensitivity, butter-flour mixture might be given without danger. I have used soya bean milk with success in some cases; but gain in weight is slow, and a dramatic result from dieting is not usually apparent. Even skin tests may be of no value as a guide to finding the offending substances. Indeed, in some cases diet appears to exert no influence at all, and we must ask ourselves if this is because diet is not specifically important in a particular case, or if we have not made our experiments clear-cut and so our results are conflicting.

In dealing with sensitivity in the child when we know the offending foodstuff, various plans may be followed: (i) Elimination for a period in the hope that spontaneous recovery will ensue, as sometimes happens. (ii) Desensitization: (a) by the mouth in graded doses of pure element, which is completely eliminated from the food meanwhile; (b) by administration in an altered state with gradual lessening of the alteration to allow of desensitization; (c) by injection (rarely used).

It is in some cases hard to find an initial dose that will not produce a reaction; for example, one drop of milk in cases of severe milk sensitization may be sufficient to cause symptoms. Treatment by injection, especially with inhalants, is valuable in some cases.

In dealing with sensitivity to inhalants it is comparatively simple to have a room with little furniture, no eiderdown (if feathers are important), no silk clothing if silk is implicated, no kapok pillows (fresh kapok sterilized by steam may be valuable, or sheep's wool may be substituted), and linoleum as a floor covering. If the room is carpeted it must be cleaned by suction at frequent intervals. In this way dust is minimized. If an outdoor veranda is used, care must be taken to avoid having grass pollen *et cetera* in close proximity. Even so, the elimination of inhalants may be a matter of difficulty, as house dust still contains minute quantities. A dust-free atmosphere, as advocated by Storm van Leeuwen, though efficacious, is impossible in this country. Even in Leyden it could be used as a temporary measure only.

I have not considered variations of gastric acidity to be significant in these conditions, as the evidence is conflicting, and no one form of treatment, such as the administration of hydrochloric acid, is always effective.

The aim in dealing with infantile eczema is as follows:

1. To relieve metabolic stress by providing a well-balanced, non-irritating diet.
2. To desensitize to offending substances, dietetic or otherwise.
3. To avoid infection as far as possible and to prevent damage to the skin by scratching and rubbing.
4. To alleviate distress and to prevent psychological trauma.
5. To provide for special treatment, such as the administration of raw linseed oil, when indicated.
6. To use such local applications as shall be suitable in each stage of the eruption.
7. To safeguard the child as far as possible from other allergic manifestations.

INFANTILE ECZEMA.¹

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Definition.

THE definition of infantile eczema involves the meaning and implications of the term "eczema". Attempting to define "eczema" is a perilous adventure on the high seas of controversy. The term is generally recognized to apply to a particular reaction on the part of the cellular and vascular elements of the skin, which lead to the following manifestations. Generally speaking, there is an initial erythema or redness, followed by œdema or swelling, with the development of fine papulation and vesiculation, which may be evanescent stages preceding the weeping phase, in which more or less exudation will occur. The exudation may form a coagulum or incrustation, or on the other hand the outpouring of fluid may be so free and the patient's rubbing so persistent that there is no opportunity for coagulation. The weeping stage is variable in duration, and sooner or later the reaction subsides and involution occurs, with the formation of scale. This cycle of events may be repeated indefinitely; restitution of the skin is always complete in the absence of gross secondary infection. The severity of the whole reaction varies considerably. Areas will be found showing different stages in one individual, and there may be a tendency for the process to become stabilized at one stage or another and to oscillate at that particular level.

The very nature of the sensation known as "itch" is as yet imperfectly understood. One view is that itching is a special function of the pain mechanism. Ehrenwald's experiment with itching powder, quoted by Goldsmith,⁽¹⁾ shows that the vasomotor

phenomena which may accompany pruritus are an autonomic reflex from the sensory stimulation; they are therefore not the cause but the result of the itching. The itch sensation demands the existence of both the touch and pain mechanisms. Again, according to Rothman, spontaneous itching in eczema and prurigo occurs only before and during the early development of fresh lesions. It is important to remember that the itch stimulus applied in sleep may give rise to scratching.

True infantile eczema is fairly consistent in its clinical appearances and distribution. It may occur three or four weeks after birth or later during the first few months of life. The usual picture is that of a well-nourished infant, with red weeping or crusted areas on the prominences of the cheeks, with or without bleeding. The scalp may also be affected. As a rule erythematous areas with a fine papulo-vesicular tendency appear also on the prominences of the forearms and legs, and these patches likewise proceed to the raw, weeping stage. Patchy erythema may also appear on the body, and ultimately a generalized eruption may be present, weeping in some areas and scaling or encrusted in others. Improper treatment may lead to generalized exfoliation. The picture may be varied by the presence of secondary infection. The rash tends to become flexural at the age of about six months, at the weaning period, or towards the end of the first year. The condition is then known as flexural prurigo (Besnier). At about the same time a tendency to wheezing may be noticed, declaring the onset of asthma. With remissions and exacerbations the infantile eczema goes on its persistent way, sometimes lasting till towards the end of the second year, and perhaps going on indefinitely, alternating with asthma if flexural prurigo or asthma has developed.

Ætiology.

Predisposing Factors.

It is surprising how frequently inquiry will disclose a neuropathic inheritance in greater or less degree. There may be a history of nervous instability in the parents' families, on either side. It is almost a rule to find either parent highly strung, temperamental and over-anxious. Occasionally, too, there is a history of the mother's having been troubled by strain or anxiety during pregnancy. This perhaps accounts for the more frequent occurrence of infantile eczema among first-born children. A history of asthma, hay fever or other allergic phenomena may be given by either parent, or such disorders may be present in their respective families. If we regard infantile eczema as an allergic disorder, these factors are of importance.

Exciting Causes.

The physician's opinion concerning exciting causes will depend on the viewpoint taken of the causation of the eczematous reaction, whether in adults or infants. Many accept the theory that all eczema is due to some external irritant or other, and that it is necessary to discover the external

¹Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

irritant operating in any particular case. This approach to the problem involves the use of patch and scratch tests to determine the causative irritant. In infantile eczema, however, the range of possible irritants is limited. It has been suggested that the incidence of the rash on the cheeks of the child may be due to contact with the skin of the breast of the mother, perspiration from which might be the active irritant. Infantile eczema occurs on the cheeks of artificially fed infants, so that this idea cannot be considered seriously. Soaps and dusting powders could possibly cause dermatitis, but not the classic manifestations of infantile eczema. Those believing in the external origin of eczema state that the skin of the infant with infantile eczema is extremely delicate and sensitive to external irritants that would not affect a normal skin. There is no evidence to support this assertion. When eczema is already established we can appreciate that the broken raw skin will be easily irritated by many physical agents, including changes of temperature. The unaffected skin of the infant is not specially susceptible to irritants, and the napkin area is not frequently involved.

Adamson⁽²⁾ takes the point of view that eczema is always caused by the application of some local irritant, and he states that infantile eczema is acquired as a result of local hypersensitiveness of the skin to what may be called normal irritants, and that it does not depend on any of the internal factors, such as nervous influences, inherited constitutional predispositions, intestinal intoxications and metabolic disturbances. It must be emphasized that the external theory of the causation of eczema does not satisfactorily account for the classical distribution and symmetry of the lesions of infantile eczema on the face and the prominences of the arms and legs.

The truth would appear to be that in eczema we meet with a potentiality of the skin to react in a certain way when the stimulus of friction or scratching is applied. Friction is the stimulus essential to the development of the eczema reaction. The objective appearance of the skin is normal until the patient experiences the sensory disturbance known as itching, and thereupon, in the absence of mechanical restraint, friction is applied to the irritable parts by hands and feet. Friction may be applied consciously in the waking state or unconsciously during sleep. Children swing the head against the pillow, rubbing scalp and cheeks in this way. If the hands are tied, the head will be inclined so that the cheek may be rubbed against the point of the shoulder. The body is swung from side to side and rubbed against bedding or clothing.

We have no knowledge of the conditions governing the distribution of the pruritus which impels the friction that initiates these vascular and cellular changes in the skin. It is difficult to accept the idea of a circulating irritant, because the irritation and eruption consequent upon friction tend to occur in crises, relief coming when the oedema of the skin is relieved by exudation or weeping. Thus we see

one sensation replaced by another. The irritation of the part is replaced by soreness or painfulness, and the damaged area is left alone till some degree of recovery has taken place, with restitution of its potentiality to react again. It is clear that attacks in children may be provoked by conditions that give rise to nervous agitation, such as delay in feeding, disturbance of sleep or lack of attention. These children are usually alert and responsive, and peculiarly fond of notice, and as long as their attention is diverted by someone playing with them, they cease to scratch, but relapse as soon as they are left to themselves. Sudden changes of temperature may evoke attacks, probably causing irritation of the vasomotor system.

Distribution and Clinical Course.

The initial lesions, as already indicated, are on the prominences of the cheeks, more rarely as indefinite erythematous areas on the scalp. Prominences of the forearms and legs are next involved, and all these areas may be denuded, weeping, or perhaps bleeding if the excoriation has been severe. A variable degree of encrustation and sometimes blood crusts will be present. The general body surface may be involved in a patchy, perhaps finely papular, erythema; but the napkin area may escape altogether. The progress of the condition varies a great deal, and there is an occasional tendency to remission. In a moderately severe case, however, the disorder never actually clears up. During remissions there is usually merely an improvement for a day or part of a day. As a rule an infant with eczema will rub and tear at his skin whenever mechanical restraint is removed, unless his attention is successfully diverted by play or otherwise. Throughout the course of infantile eczema there is usually a moderate degree of cervical glandular enlargement, and this becomes greatly accentuated if secondary infection occurs.

The eczema may tend to fade away gradually, or the character of the eruption may change to a flexural prurigo after six months or more. Is it that the infant wildly tears at the prominences in early life but gradually acquires a sensory discrimination leading to rubbing of the flexures, finding that more satisfaction or pleasurable sensation is derived from rubbing these parts? It is noteworthy that there is a persisting and not unpleasant sensation derived from stroking the normal skin of the flexures.

The capacity to react in this fashion is, I believe, the inborn characteristic which becomes manifest when stresses and strains oppress the individual. The child with infantile eczema shows failure of adaptation. Dentition is frequently delayed and the child may be slow to walk and talk. Some of these children reject all new foods when first given to them. When the child has adapted himself to his new environment—this world—the tendency to react disappears; but it may reappear with any subsequent disturbance in his life history, which is the result of maladjustment or a call for adaptation beyond his capacity.

Diet.

A consideration of the part played by diet, in other words, food sensitization, in infantile eczema involves a study of the allergic state. Sensitization is said to be transferred by the trans-placental route. It is sometimes maintained that it is not the foodstuff itself that is responsible, but some of the intermediate products of digestion. It is the general finding of those observing infantile eczema that 80% of the infants are sensitive to egg white and that they may show startling and even alarming intolerance when egg or foods containing eggs are first introduced into the diet. Vomiting and diarrhoea may occur in company with urticaria or perhaps giant urticaria, in which swelling of the tongue is a common feature, as well as respiratory distress if the glottis is involved. These disturbing manifestations may be dispelled by minute doses of adrenaline, otherwise they pass away within a few hours. Thereafter the child may be found to have an antipathy towards eggs and almost any food containing eggs. Hill and Sulzberger⁽³⁾ observed reactions to tests for sensitivity to egg, milk and silk on children under three months of age, and to wheat when the children were aged six months or more. Desensitization is achieved by the administration of an increasing number of drops of egg white by mouth daily. I have not found injections of egg white to be of any value. There are not many reactions to environmental exogenous inhalants during the first year. As the infant grows older, sensitiveness to other proteins may develop, particularly if there is a tendency to prurigo and asthma. The question remains: what part does allergy play in the genesis of infantile eczema? Elimination of egg in all forms from the diet of the nursing mother does not have any influence on the course of the infantile eczema. Again, the common experience is that infantile eczema occurs with equal frequency in breast-fed and artificially fed infants. The positive skin test may persist for years after the eczema has disappeared (Woringer⁽⁴⁾). Milk, human or animal, is sometimes blamed as a bearer of the allergic factor, and artificial milk substitutes have been devised and milk preparations specially treated by heat. The value of this measure is questionable. The practice of transferring the infant to light baby diet as soon as possible, to eliminate milk, has not been found to achieve any immediate benefit. Diet juggling has had no influence on the course of infantile eczema in the opinion of most dermatologists. If the child is being overfed or is taking an improperly balanced diet, the eczema may be worse because of the upset to the general condition. Errors in diet are therefore to be regarded as aggravating factors. The idea that these children are hydræmic is no longer seriously considered. Attempts have been made to build up a case for vitamin lack in infantile eczema, but this has proved a peculiarly sterile field.

Prognosis.

The nutrition of the child in infantile eczema is usually well maintained in the absence of infection.

When difficulty in feeding arises and there are progressive loss of weight, vomiting attacks and bowel disturbances the outlook is distinctly unfavourable.

The prognosis as to life depends on the nature of the complications. Infantile eczema tends to cease in the majority of cases towards the end of the first twelve months; but if flexural prurigo becomes well established the condition may not subside until the end of the second year, and it may even persist into adult life if asthma develops.

It is impossible to forecast results.

Complications.

Local Infection.

Secondary infection is the bugbear in infantile eczema, as from it arise serious and sometimes fatal conditions. During the course of infantile eczema periods of pyrexia may occur for which no basis can be detected clinically. Some infants have a raised temperature during the acute exacerbations; but pyrexia always demands careful investigation. When infection occurs, there may be obvious encrustation, shielding accumulations of pus, or there may be little visible change apart from enlargement of lymphatic glands, usually in the cervical region. When a large, red, fluctuant swelling has developed, suppurative adenitis is present and early incision is demanded. Suppurative adenitis is always a grave complication, frequently leading to septicæmia and pyæmia, with cutaneous and visceral abscesses, sometimes empyema. Other suppurative phenomena include *otitis media* and mastoiditis. Infantile eczema may become impetiginous in any areas as the result of streptococcal invasion.

Respiratory Infections.

Many of these infants have a hypersecretion of mucus, which may be particularly obvious during feeding time. Infants with this mucous catarrh are prone to recurrent attacks of bronchitis. Atropine is an effective remedy for this excessive secretion. Bronchopneumonia develops in this group and recovery is usual, except when there is malnutrition.

Asthma.

Wheezing may develop after the first six months and proceed to asthma towards the end of the first year. Meanwhile the infantile eczema has changed to flexural prurigo, with reddening, thickening and excoriation.

Malnutrition.

It has been said that infantile eczema is found in fat, well-nourished infants. In some, however, there is a progressive deterioration associated with loss of weight and an intolerance of all dietetic measures, and the infant slowly fades away, the skin condition occasionally progressing to a generalized erythrodermia.

Panophthalmitis.

A distressing, though rare complication, is suppurative conjunctivitis and corneal ulceration with

perforation, leading to panophthalmitis and complete destruction of the globe. This occurs only in fatal cases in my experience.

Differential Diagnosis.

Seborrhæic Dermatitis.—Seborrhæic dermatitis is the condition with which infantile eczema is most frequently confused. It usually commences with an adherent cake or scale over the anterior fontanelle, with yellowish or dirty scaly areas scattered over the top of the scalp. There may be intertrigo behind the ears, blepharitis, intertrigo or reddening of the folds of the neck, axillary intertrigo and red patches over the chest and back. The umbilicus may be red and the napkin area is often involved. The patches of seborrhæic dermatitis on the trunk are usually dark red in colour and circumscribed; there may be some yellowish scaling. The spinal furrow may be especially picked out with a strip of these ovoid reddish areas extending perhaps to reddened buttocks. If the process becomes acute, the entire scalp may be heavily encrusted as a result of oozing. This condition, in the less acute stages, responds very well to the use of a weak ointment of salicylic acid and sulphur, whereas true infantile eczema would be very much irritated by the use of sulphur.

Impetigo Contagiosa.—*Impetigo contagiosa* may be found in the form of wafer-like scales or honey-coloured encrustations over the face and in patches on the upper part of the body. There may be some degree of adenitis.

Xeroderma and Ichthyosis.—The dry, rough skin of xeroderma and ichthyosis easily becomes inflamed, as evidenced by redness, cracking and furring of the epidermis, as a result of the excessive use of soap and hot water. This is particularly prone to occur in winter. The history of the dry skin and the absence of the typical attacks of infantile eczema will assist in making the necessary distinction.

Impetigo and Scabies.—The characteristic burrows and linear papules of scabies will be found in the folds about the hands and feet, as well as in the region of the axillæ and umbilicus. Scabetic lesions on the face are very rare.

Sulphur Dermatitis.—The excessive use of sulphur in the treatment of scabies may produce red, rough areas and patches, particularly about those parts usually affected by scabies.

Severe Papular Urticaria.—Papular urticaria may become impetiginous and eczematous. Wheals, papules and sometimes bullæ may be formed on the outer sides of the arms and legs. Papular urticaria may develop during the course of infantile eczema.

Erythema Infantum.—In *erythema infantum* (erythema Jacquet) the napkin area is affected with a dull red erythema, with glazed areas and superficial ulcers over the convexities of the buttocks and folds, as the result of the external irritant effect of soiling and wetting. Frequent changing and the application of large quantities of dusting powder will usually bring about healing.

Congenital Syphilis.—The lesions of congenital syphilis may be found on the buttocks, hands and feet as well as on the face. They are usually macular, papular and infiltrated lesions with a characteristic colour.

Management and Treatment.

General Measures.

The chief points in the management include: (i) protection of the affected parts; (ii) appropriate methods of restraint to prevent scratching; (iii) prevention of secondary infection; (iv) the use of sedatives, internally and externally; (v) transference of the management from the anxious mother to a trained nurse, or admission to a suitable hospital.

Protection is achieved by the use of face masks, made of madapolam or butter muslin, with holes for the nose, eyes and mouth. The ointment is applied on the inner side of the mask. Some children, however, are exceedingly intolerant of such coverings, and in hot weather they are certainly better without them. The clothes next to the skin should be light and soft, preferably of cotton material, as some infants are sensitive to silk. Over-heating of the body and exposure to sudden changes of temperature are to be avoided.

Restraint may take the form of splinting. Splints can be made of cardboard for use on the arms and legs. In severe cases it may be necessary to tie the arms and legs to the sides of the cot. When this is done, it is important for the child to sit up while being fed, and for an hour or more in the morning and afternoon, as this diminishes the tendency to bronchopneumonia. Restraint must be continuous, as the child can produce tremendous damage if released for a few moments without supervision.

Prevention of secondary infection will be achieved by cleanliness and aseptic precautions. Crusts should be removed, as necessary, by the use of starch poultices.

Restlessness and sleeplessness are major problems in infantile eczema. The child must have rest. Comparatively large doses of sedative are tolerated by these infants. Phenobarbital, in doses of 0.01 to 0.015 gramme (one-sixth to one-quarter of a grain), two or three times a day, will be very helpful in some cases. Sometimes, however, it seems to have an exciting or irritating effect. Bromide alone has little effect; but chloral hydrate and bromide seem to form the optimum combination. The addition of belladonna is an advantage, especially when there is any excess of mucus. Small doses of aspirin may be effective.

The child has little chance of doing well in the hands of a mother of the nervous type, who, as the result of anxiety, sleeplessness and disappointment, is rendered incapable of the care of her infant. These children always do better away from the emotional atmosphere surrounding them in their homes. They require peace and quiet.

Local Treatment.

The starch poultice is the agent of outstanding value in the local treatment of infantile eczema. It is better without the addition of boric acid. The starch poultice is of maximum utility in states of encrustation, but is soothing and gratifying in any stage of infantile eczema; in other words, the starch poultice is never wrong. Zinc and starch paste should be applied in the acute weeping stages, and when restraint and other methods have reduced the process to a subacute phase, an ointment containing tar is useful. Crude coal tar, pure or in strong concentration, provokes a pustular eruption in a very short time, and the various preparations containing tar extracts are not successful. The most satisfactory remedy has proved to be *Unguentum Picis Liquidæ* in a strength of 1% to 5% or more, in a suitable zinc base. Weak silver nitrate solutions and tannic acid lotions may produce a temporary coagulum on an inflamed surface that is weeping profusely.

Soap and water are to be avoided in the acute stages; but there is no objection to the gentle use of plain "Castile" soap and warm water if there is no weeping. The generous use of warm olive oil causes the skin to become red, oedematous and almost spongy. It is very readily damaged after such applications. In addition it may be said that there is far too much cleaning up done, especially in hospital wards, and the tendency to over-treatment needs watching.

The use of X rays in the treatment of infantile eczema should be mentioned only to be vigorously condemned. X rays can have no effect in shortening the duration of infantile eczema. The use of Grenz rays has likewise no real value or justification.

In the acute stages ultra-violet light must act as an irritant, because strong sunlight or sunburning irritates any acute dermatitis. Ultra-violet light baths in the subacute stages have not made any difference to the course of the eczema in my experience.

Internal Medication.

Sedatives have already been discussed.

A number of drugs have received favour from time to time. Thyroid extract in small doses seems to be always popular; but the basis for its use in skin conditions other than myxœdema is a mystery to me. Perhaps the dry, rough, pseudo-ichthyotic skin, sometimes seen in late infantile eczema or prurigo, accounts for the use of thyroid extract; but it is of no value in true ichthyosis either. Ephedrine has no useful effect, although injections of adrenaline, in a dose of 0.2 to 0.3 cubic centimetre (three to five minims) of a 1 in 10,000 solution, will cause an acute exacerbation to subside rapidly. The dose may be increased if adrenaline is well tolerated. Vitamin preparations of all sorts are advocated. They may be beneficial in a general sense; but they have no influence on the course of infantile eczema. Hydrochloric acid, given internally, has a vogue at the moment; but I have not been able to convince myself that it is of any value.

Injection Treatment.

Peptone injections were given at one time; but the use of this preparation has lapsed. Auto-hæmotherapy has been practised; but it has no more to commend it here than it has in any other skin condition. Injections of the mother's milk and serum have also been used. Sterile milk and proprietary preparations, such as "Aolan", have had their day. When there is sensitiveness to egg, injections of egg white have been given. It has not been possible to achieve desensitization by such injections and the eczema has not been influenced.

Summary.

The attitude towards infantile eczema should not be hopeless when there is so much we can do and there is such a better understanding of the management of these infants today.

I have set down a review of clinical observation and experience in the skin department of the Children's Hospital, Melbourne, during the last thirteen years.

Acknowledgements.

I wish to thank the honorary medical staff of the Children's Hospital, Melbourne, for the opportunities for study afforded me.

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Reports of Cases.

TERATOMA OF THE OVARY IN A CHILD.

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D.P., A FEMALE, aged twelve years, was brought to me by her mother on October 14, 1936, with the following history. The day previously her mother, while fitting a new dress on the child, had noticed that her abdomen was rather prominent, and on attempting to "push it in" found that it was very hard and enlarged. This was the first time it had been noticed.

On examination the abdomen presented at first sight all the appearances of about a five to six months' pregnancy. There was a prominent, hard mass, easily palpable, occupying the whole of the lower portion of the abdominal cavity, freely movable except where it appeared to be attached to the region of the left ovary. The girl had complained of no pain and had had no urinary symptoms. She had never menstruated. Close questioning disclosed that there had been a tendency to constipation recently. She said she had not said anything about the swelling as she "thought it had to be like that". A diagnosis of ovarian tumour, possibly a tense cyst, was made.

At operation two days later a large solid tumour, as big as a small football, and weighing three pounds, was found

attached in the region of the left ovary by a fairly wide pedicle containing several large veins. The left Fallopian tube was adherent to the tumour close to the pedicle, but I found little difficulty in separating it. The pedicle was ligated in sections after the tumour had been delivered through a large mid-line incision. There were no other adhesions, and the growth was completely encapsulated.

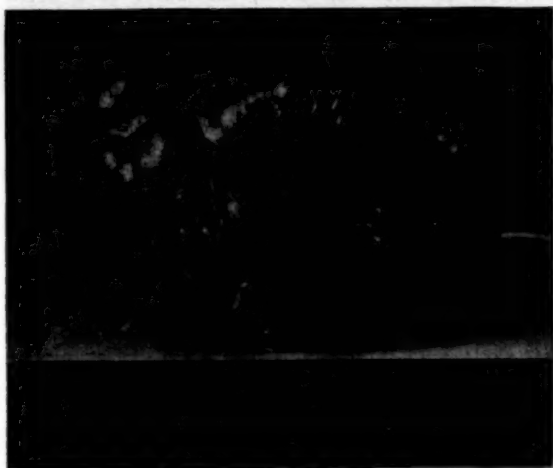


FIGURE I.

The right ovary was normal. Convalescence and subsequent history have been uneventful. The child is very well and shows no evidence of any recurrence up to date.

On section the tumour presented a variety of appearances. There were numerous small thick-walled cysts,



FIGURE II.

fleshy areas, and several hard cartilaginous portions. A portion was sent to Professor MacCallum for a pathological report, which is as follows:

Section of the specimen shows the histological structure of a teratoma. The differentiation of the tissues was extremely varied and represents derivatives of all embryonic layers. There is no indication of malignant development in any of the tissues, but in a tumour of that size it is not possible to be dogmatic about its innocence.

The points of interest which have induced me to record this case are: (i) the almost complete absence of symptoms with such a comparatively large growth in a child of twelve, and (ii) the fact that the child thought so little of the swelling that she did not bother to mention it. The accompanying illustrations show the appearance and size of the tumour.

Reviews.

NEUROSIS AND THE MODERN WORLD.

DR. MACPHERSON LAWRIE gives food for thought in his little book entitled "Nature Hits Back".¹ Dr. Lawrie is a well known London psychologist, and in this volume he gives his views on the subject of man in the twentieth century.

He writes in a pessimistic strain, though, as he expresses himself in delightful English, the book is easy to read. He considers that practically everyone nowadays is suffering from nervous tension in some form or other. He emphasizes the fact that the medical profession, while devoting its time to the attempted healing of organic diseases, neglects the psychological disabilities which are the real causes of most ill-health and unhappiness.

He considers that the outstanding nervous affliction of the present day is fear, which leads to instability and lethargy. This fear is the main cause of universal birth control, and eventually will lead to the decay of the nation. Dr. Lawrie blames our artificial mode of living as being the cause of universal nervous instability. He lays stress on the fact that fatigue and defective nutrition undermine the constitution. He attacks the evil of the consumption of artificial foods which flood the markets, replacing Nature's abundant gifts, and which, according to him, cause the appalling prevalence of dental decay. However, we cannot altogether agree on this point, as we know that apparently even the most correctly fed children at times develop dental decay.

There is a chapter dealing with the effect of nervous tension on sex life. Dr. Lawrie holds the view that as birth control has robbed sexual congress of much of its meaning, far more stress should be laid on suitable mental companionship as the chief factor in marital happiness than on harmony in matters of sex.

The little book will interest many general practitioners; it may be useful to give to some patients to read. The author relentlessly exposes the secret weaknesses which sap the stability of the nation, but he does not ring quite true when he discusses their remedies. Most of us will not agree that adequate sleep, physical fitness and a pure food supply will dissipate the fear to face life which causes so much unhappiness today. However, this is a book which will assist us to think clearly and to understand more fully the neurotic wrecks who are all too common in this modern world.

BLOOD DISORDERS.

THAT a second edition of "Disorders of the Blood", by Whitby and Britton,² should be called for within two years justifies the very favourable review in this journal of the first edition, when it was described as the best British text-book on this subject published to date. A perusal of the new edition confirms this opinion.

The arrangement of the subject matter is unaltered, though the size has been increased by thirty-five pages and there are nearly 400 changes in the bibliographies.

¹ "Nature Hits Back", by Macpherson Lawrie; 1935. London: Methuen and Company, Limited. Crown 8vo, pp. 180. Price: 5s. net.

² "Disorders of the Blood: Diagnosis, Pathology, Treatment and Technique", by L. E. H. Whitby, C.V.O., M.C., M.A., M.D., F.R.C.P., D.P.H., and C. J. C. Britton, M.D., D.P.H.; Second Edition; 1937. London: J. and A. Churchill Limited. Medium 8vo, pp. 582, with 12 plates and 60 text figures. Price: 21s. net.

The value of classifying the anemias in terms of cell size and hemoglobin concentration rather than on colour index is emphasized. The classification is based on the cause of the anemia—dyshæmopoiesis, hæmolytic or hæmorrhagic—and then on the absolute values calculated from a careful analysis of the cell count, cell size, cell volume and hemoglobin content of the red corpuscles. The anemias fall into the groups macrocytic, normocytic or microcytic in terms of cell size, and normochromic or hypochromic as regards hemoglobin content. The term "hyperchromic" is discarded, since in a literal sense it implies over-coloration of the red cells in the stained film. In the sense of a high colour index it is inevitably associated with macrocytosis, though, of course, macrocytic hypochromic anemias may occur. Correct classification is a help in treatment as well as in diagnosis, since macrocytic anemias usually respond to liver and hypochromic anemias to iron therapy, while normocytic and simple microcytic anemias rarely respond to either.

This edition contains a more elaborate discussion of reticulocytic reactions, and their significance is evaluated in the light of recent work.

Attention is drawn to the value of the degenerative index in the differential leucocyte count, that is, the proportion of degenerate cells to normal neutrophilic cells in infections. The persistent presence of more than 75% of degenerate cells indicates a fatal outcome.

Following Witta, the paroxysmal hemoglobinurias are classified into those due to (a) cold, (b) exertion, (c) nocturnal and (d) paralytic myohæmoglobinuria.

Recent advances in treatment receive due consideration. For instance, the value of the use of ascorbic acid, of snake venom, of Congo red and of X rays in *purpura hæmorrhagica* is discussed; the use of vitamin D before operation in cases of obstructive jaundice with a prolonged bleeding time (Ivy's method) is advocated, while gastric lavage is of benefit in some cases of *polycythæmia vera*. As judged by bone marrow biopsy and blood findings, splenectomy has been completely successful in one typical case of aplastic anemia, in which operation was performed over a year ago, though previously transfusions had been necessary every three weeks. In Hodgkin's disease encouraging results are reported from the use of long-continued small doses of a vaccine of the elementary bodies first isolated and stained by Gordon.

Considerable additions to the final chapter on the technique of the laboratory examinations required for the investigation of blood disorders have been made, especially with reference to supravital staining, methods for determining the size of red corpuscles, sedimentation rate, bone marrow biopsy and the basophilic aggregation test for lead poisoning.

It is obvious that the authors have spared no effort to keep their book authoritative, comprehensive and up to date; it can be recommended to all practitioners interested in the fascinating subject of diseases of the blood.

VITALITY AND ENERGY.

Dr. T. E. HAMMOND saw the worst of the campaign on the Gallipoli Peninsula and has had long experience as a surgeon and urologist. He has also been an amateur boxer and has for years been interested in professional pugilism. A study of patients suffering from a diversity of diseases has led him to ask himself the questions: "What is vitality?" "What is energy?" "What is stamina?" A want of vitality is apparent in those people who possess insufficient energy to do their ordinary work, to enjoy life, to be successful at games. So far, writes Dr. Hammond, there is no trustworthy test by which the essentials for robust life may be estimated; energy and vitality are mere abstractions, fit only for metaphysical and philosophical discussion. But the medicine of the future will have to

regard these airy terms as capable of measurement by means yet undetermined, something capable of being visualized in a concrete way. We know that there is a certain resistance inherent in all living tissue, but we cannot define "resistance", though we are reasonably certain that it is bound up, in some way as yet undetermined, with the "constitution" of the subject. No instrument yet invented can assess the worth of a given constitution nor link up the value in a crisis of this constitution with factors of temperament, vital energy and the existing state of health. It follows, then, that the clinician is largely dependent on experience; and the corollary is that his liability to error is incalculable, since, however expert and specific a given treatment may be, a response to that treatment will be forthcoming only if a favourable reaction on the part of the patient, impossible to assess, is the result. Idiosyncrasy plays a part in the success or otherwise of treatment, but there is so far no way of estimating the possible success except by methods of trial and error. Thus it is that the action of drugs is often a matter of doubt. There are those, for instance, who say that "Salvarsan" has no direct action upon the spirochæte; after an intravenous injection of this, or some allied preparation, 80% of the whole is excreted within one hour; and as a syphilitic lesion leads to endarteritis and fibrosis, but little of the remedy can reach the spirochæte. It is therefore likely that some curative factor, as yet not understood, comes into play. And why is it that bismuth preparations, without effect upon spirochætes outside the body, seem to lead to the cure of syphilitic lesions in man?

We cannot dismiss offhand the hypothesis that there is a special centre for life and energy in the basal ganglia, upon the nature of which depend the type and efficiency of the constitution. There is no exact evidence to support the theory, at present a matter of mere conjecture; but in Dr. Hammond's view certain phenomena which are commonplaces attendant upon a "knock-out" in the ring and of bullet wounds of the base of the skull, are strong confirmatory evidence.

As appendices to his book Dr. Hammond has written most interesting and informative chapters on the functions of the testes after puberty, and upon the question of euthanasia. His conservative views upon the latter subject are a well-timed and temperate reply to much of the half-baked sentimentality which has been given an airing during the past few years.

SURFACE ANATOMY.

Dr. ROBERTS' little book on surface anatomy is very concise and conveniently arranged.¹ It consists of a series of plates reproduced from photographs, mostly of the living subject, accompanied by explanatory notes, which in each case are placed on the same page or on that opposite the appropriate plate. The advantage of such an arrangement is obvious. While the subject of surface anatomy is usually adequately treated in the larger text-books of anatomy, it is nevertheless very convenient for the student to have a book of this kind, which presents the main facts in a small space. The book therefore should prove popular. A few minor points for correction are noticed. For example, in Plate 8 the bracket indicating the cervical enlargement does not correspond with the surface marking; on page 19, in the seventh line from the bottom, and on page 22, in the sixth line, it appears that "chondro-sternal" is meant, not "costo-chondral"; on page 33, in the third line from the bottom, the words should be "In front of it" instead of "Behind it", *et cetera*; on page 53, in the fifth line from the bottom, "extensor digiti" should read "extensor digitorum". On the whole, the book is well prepared and set up, and will undoubtedly be very useful to the student.

¹ "Vitality and Energy in Relation to the Constitution", by T. E. Hammond, F.R.C.S., 1934. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 326. Price: 12s. 6d. net.

¹ "Surface Anatomy", by W. E. Roberts, M.R.C.S., L.R.C.P., with a foreword by A. N. Burkitt, M.B., B.Sc., 1937. Australia: Angus and Robertson Limited. Medium 8vo, pp. 104, with illustrations. Price: 7s. 6d. net.

The Medical Journal of Australia

SATURDAY, NOVEMBER 20, 1937.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

NUTRITION.

ON many occasions during the last few years the subject of nutrition has been discussed in these pages. Reference has been made to the useful work that is being done in Queensland, to the formation of the Commonwealth Advisory Council on Nutrition, and to the extensive investigations of the League of Nations. In the issue of November 14, 1936, four volumes on "The Problem of Nutrition" published by the last-named body were reviewed. The first of these volumes was the interim report of the Mixed Committee on the Problem of Nutrition; the second volume was a "Report on Physiological Bases of Nutrition"; the third was entitled "Nutrition in Various Countries"; the fourth dealt with statistics of food production, consumption and prices. The Mixed Committee of the League of Nations has now issued its final report on the relation of nutrition to health, agriculture and economic policy.¹

This report represents the result of two years' work undertaken at the behest of the League by

experts from many countries in matters of health, agriculture and economics. It is at once comprehensive and authoritative; and while it will naturally appeal chiefly to those interested in public health and engaged in its promotion, the subject matter is presented in so simple a fashion that the laity should be able to appreciate every aspect of it. The several parts of the report are somewhat peculiarly arranged. The summary and conclusions are placed at the end of the first part, which, in addition to an introductory chapter tracing the history of the committee and of similar bodies, includes a chapter entitled: "A Century of Progress in Nutrition and Public Health". With the summary are reproduced the recommendations published by the committee in its interim report. The second part of the report is devoted to nutrition and health. It includes an account of the principles of correct nutrition; the vitamins are described, the minerals necessary to health are enumerated, and reference is made to the diseases resulting from a deficiency of them. This is followed by a section devoted to special dietary needs of different classes of persons and age groups; the groups discussed in this section include expectant and nursing mothers, infants, children of the pre-school and nursery school age, children of school age, adolescents, young soldiers and adults. This section is particularly valuable and would make good propaganda for the public. The statement is made that as a rule maternal and infant welfare institutions do not yet follow the child beyond the end of its second year. This is not true of all parts of Australia, but it would be an enormous advantage to the future health of the nation if it were realized that "in the early years of school life many children are already 'damaged goods'". Part II concludes with a section embodying the main features of what is known as the London report on "The Physiological Basis of Nutrition", which formed Volume II of the report considered in these pages in November, 1936. The public should be made to realize, as is stated in this section, that milk is the nearest approach that we possess to a perfect and complete food, and that no other known food can be used as a substitute for it. Probably few hygienists realize that if this were

¹ League of Nations Publications. The Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy; 1937. Geneva: Publications Department of the League of Nations; Australia: H. A. Goddard Limited. Medium 8vo, pp. 327. Price: 7s. 6d. net.

not so, milk would long ago "have disappeared from the dietary of civilized people". Milk is not only the most nutritious, but it is also the most inconvenient foodstuff and it may at times be dangerous. The third part of the report consists of a somewhat detailed examination of recent trends in food habits; and agriculture is discussed in relation to nutrition. The view is expressed that attention to better nutrition of the people will prove of benefit to agricultural systems. This question is bound up with the purchasing power of the consumer and his knowledge of the nutritive value of protective foods and also with his willingness to apply this knowledge. A well-known consulting physician stated recently that he knew of nothing that appealed to him less than to be seated before food that was given to him because it would do him good—he thought that such sentiments were most uninspiring. As we have stated before, people, even consulting physicians, will eat what they like, not what they should; they should be taught to like what is good for them—a matter of some difficulty. Without doubt a great deal of the malnutrition of today is due primarily to poverty. In this connexion attention should be paid to what is written in this report about the possibility of improving social services by such measures as family allowances, the provision of school meals and of milk for expectant and nursing mothers. Although the report shows that much has been accomplished in certain parts of the world, it is quite clear that much remains to be done.

We have shown that this report is a document of considerable value. It is not an expensive book and should be studied by all who are interested in preventive medicine, in other words by every medical practitioner. At the same time the several Branches of the British Medical Association in Australia should ask themselves what they are doing to promote knowledge of nutrition among the people of their States. The other Branches might well follow the lead of the Queensland Branch. Evidence of a certain amount of success in Queensland has not been wanting, but the members of the Branch would doubtless be ready to acknowledge that much still remained to be done. The British Medical

Association owes it to the community to make an effort to improve the nutrition of the people. If members are reluctant to undertake the work on their own account, they might at least try to stimulate health departments to embark on a nutrition campaign in the daily Press; the newspapers would in all probability lend their cooperation in such a venture.

Current Comment.

PITUITARY DIABETES.

REPORTS of experiments forming a further link between the pituitary gland and *diabetes mellitus* come from the National Institute for Medical Research, where Dr. F. G. Young has succeeded in producing a seemingly permanent diabetes by daily injections into a dog of active extracts of the anterior pituitary lobe.¹ It is common knowledge that injections of active extracts of the posterior lobe (pituiratin) raise the blood sugar temporarily. Houssay and his colleagues have shown that the integrity of the pituitary gland is essential to the continuance of the diabetic state. This experiment by Dr. Young, however, owes its importance to the fact that apparently the effects of the injections permanently alter the level of the carbohydrate balance in the direction of hyperglycaemia.

Previous attempts had been made by Dr. Young with crude ox pituitary during the previous year, but some antagonistic mechanism or antihormone returned the animal to a normal state a few days after the injections ceased. The employment of a dose sufficiently large to overcome this resistance, however, succeeded, as above described, in two out of three dogs so treated. An essential for success was that conservation and preparation of the extract had to be carried out as nearly as possible at freezing point.

The diabetes differed in several interesting respects from that of a dog from which the pancreas had been removed. The animal at first put on weight when the pituitary injections were begun. It subsequently became thin, but was strong and vigorous; it differed considerably from the weak and emaciated animal deprived of its pancreas. It was found that after the dog had become permanently diabetic, about 100 units of insulin a day were required to keep the animal's urine sugar-free on a normal (high-protein) diet. When this was stopped, after three weeks' treatment, the animal died from coma within six days, that is, nearly ten months after cessation of the last pituitary injection. Another dog did not lose weight and was alive at the time of Dr. Young's communication, although losing seventeen grammes of sugar per

¹ *The Lancet*, August 14, 1937.

kilogram of body weight a day. No histological details are provided as to the appearance of the pancreatic tissue in the dog which failed to survive. Dr. Young gained the impression that a dog deprived of its pancreas required rather less insulin to maintain its urine sugar-free than did a dog treated with pituitary extract, but no definite figures are yet available.

Certain dogs have made history in the endocrine field. They were Allen's dogs, Banting's dogs, Evans's dog; and now there is Young's dog. There is no doubt that Dr. Young's success will be followed with very great interest by all researchers in the field of carbohydrate metabolism. A study of the life history of a pure pituitary diabetes may yet help to unveil the obscurity covering the aetiology of human *diabetes mellitus*.

ACUTE APPENDICITIS IN CHILDREN.

As with many other diseases, the manifestations of acute appendicitis in children differ in many respects from those in the adult, and much has been written in the past upon this aspect of the matter, especially in relation to suitable treatment. Even now, however, many text-books of paediatrics treat the subject vaguely and briefly, so that no apology is needed for a commentary upon a paper recently published by Philip D. Allen, of New York.¹ This surgeon, working at the Bellevue Hospital, presents conclusions founded upon the observation of 612 cases of juvenile appendicitis treated in the ten-year period 1926 to 1935. The children concerned were of all ages up to thirteen years; and Allen has been able to trace the subsequent history of over 80% of those patients, 576 in number, who survived. All cases not proved pathologically to be cases of appendicitis were excluded from the study, which extended over an average period of eleven months. In all instances the patients were operated upon as soon as possible after the diagnosis was made, the usual anæsthetic used being ether. During nine years the abdomen was opened almost as a routine through a right rectus incision, but during the last twelve months of the period under review the McBurney method of approach was preferred. Various operative details as to the methods of dealing with the appendix are of interest; the organ was ligated in 350 cases, inverted in 237 and not removed in 16. In this last number extensive abscess formation would have made a lengthy search for the appendix a dangerous procedure. Drainage was invariably employed if perforation of the appendix had taken place or if there were any signs of peritonitis. In 194 of the cases, in which it seemed certain that copious drainage would occur, only the peritoneal layer of the abdominal wall was closed by suture. Transfusions of blood were given promptly to all patients with signs of severe sepsis

and to those in whom drainage was prolonged. The youngest patient who underwent operation was eleven months old; this child recovered. Of the remainder, 72 (11.7%) were in the first five years of life; 540 (88.3%) were aged between five and twelve years. The age incidence showed a numerical increase year by year to reach its maximum at the age of twelve. Many thirteen-year-old children suffering from appendicitis were in fact admitted to hospital, but the majority of these were placed in adult patients' wards and were thus not available for study. Male children exceeded females in the proportion of three to two; and of the 612 patients, 576 recovered and 36 died—a mortality rate of 5.8%.

In the United States of America there is a noticeable seasonal variation in the incidence of juvenile appendicitis; it reaches its peak in the months between January and April, a period when acute intestinal infections are rife; and there is a great fall in the figures during the autumn months. Amongst the fatal cases tabulated by Allen, death occurred within an average time of 102 hours from the onset of symptoms to the moment of operation. Amongst the survivors, the average lapse of time between diagnosis and operation was 53 hours. The shortest delay was three hours and the longest four weeks. There were thirteen cases of incisional hernia, all affecting patients in whom convalescence was protracted. Purgatives had been administered to 57% of the group of children in whom perforation occurred; in the group with unperforated appendices, 47% had received aperients.

The most important conclusion which Allen has drawn from his comprehensive study is one which years of experience have not rendered any the less important: appendectomy should be performed as soon as possible after the diagnosis is established if the mortality rate in appendicitis is to be further reduced. The symptoms and signs of the disease are much the same in adults as in children over five years old, but in the younger age groups the tokens of trouble are more elusive. It seems likely that although vomiting is often stated to be a first symptom in very young children, such patients frequently suffer from severe pain at the outset. Early operation is essential in young children for two reasons: first, they lack resistance to infection; secondly, the extent of the omentum in the infantile abdomen is insufficient to wall off infective processes.

Allen's statistics indicate that acute appendicitis of childhood is a disease which increases with the increase in age, being a comparative rarity in patients under five. They also show that cathartics hasten the onset of perforation and that the death rate leaps upwards in proportion to the delay between the onset of the illness and the time of operation. This surgeon is also convinced that the sloughing of fascial and muscular structures in the abdominal wall, whenever drainage is profuse, may be largely avoided, as, in his opinion, may incisional hernia, by suture of the peritoneum only.

¹The Journal of the American Medical Association, July 10, 1937.

Abstracts from Current Medical Literature.

SURGERY.

Successful Suture of the Aorta.

FRANK RUNDLE (*The British Journal of Surgery*, July, 1937) describes how E. Rock Carling successfully sutured a tear in the aorta. During the operation of presacral neurectomy a small unnamed branch of the aorta required a ligature. When this vessel was being ligated the artery forceps were inadvertently jerked so that the vessel came away in their points, leaving a hole in the aorta. Hemorrhage was profuse, and in the short time required to apply digital pressure to the aorta the vessel wall had been split by the force of the escaping blood, so that the hole to be closed was two centimetres (three-quarters of an inch) long. Modified Meyer's arterial clamps were applied obliquely to occlude that part of the aortic lumen in relation to the tear, which was then sewn over with a continuous "00" silk suture. When the clamps were removed there was no bleeding and no harm was done by the mishap. Rundle remarks that this case demonstrates the advisability of always having fine silk stored in liquid paraffin ready for immediate use as an arterial suture.

Extensive Burns.

H. A. BRANCH (*Archives of Surgery*, September, 1937) discusses the principles of the treatment of extensive burns and presents the details of a method which has given satisfactory results. A large dose of sedative is given—codeine, or morphine sulphate with phenobarbital. The burned areas are washed with tincture of soap; débridement of the burn is done lightly and rapidly by merely breaking the blisters and removing the loose skin. The area is then washed with sterile saline solution or a solution of boric acid. The burn is sprayed at once with a 1% aqueous solution of methyl rosaniline, and after three or four minutes the entire burned area is swabbed with a 10% solution of silver nitrate. The patient is placed in a burn tent at a temperature of 85° to 90° C. The area is resprayed with a 1% solution of methyl rosaniline every fifteen minutes for about five times. After that the spray is used once or twice a day only if necessary. Fluids are forced strongly by mouth. Hypodermoclysis of physiological solution of sodium chloride is given every six or eight hours, as indicated by the patient's condition. Fluids are given intravenously only if the temperature rises to 103° F. Transfusion is done if necessary. The patient is moved about as soon as the crust is established and is allowed to walk about as soon as the period of shock is over and if no signs of toxæmia develop. The patient is

allowed to get up and about regardless of the size or location of the burned area and usually may walk about freely after the first twenty-four hours if the burn is small, covering up to about 20% of the body surface. It is perhaps safer to keep the patient with the more extensive burn in bed from five to seven days, or at least till the temperature has been normal for about twenty-four hours. If any coagulum remains at the end of two and a half or three weeks, it should be soaked off with brine or by compresses. Compresses treated with cysteine hydrochloride, 1 in 200 solution, may then be applied to the third degree areas that are not healed, alternating every four days with compresses soaked in boric acid, or gauze treated with scarlet red may be applied to stimulate epithelization.

Intermittent Venous Hyperæmia.

G. DE TAKAS, F. K. HICK AND J. S. COULTER (*The Journal of the American Medical Association*, June 5, 1937) describe a simple method for producing intermittent venous hyperæmia combined with postural emptying of the veno-capillary bed. The method may prove helpful as a home treatment for patients suffering from obliterative vascular disease, but should be used in combination with other recognized forms of conservative and surgical therapy. Intermittent venous hyperæmia is produced by an eight-inch inflatable cuff, conically shaped to fit the thigh. The amount of pressure should not exceed the diastolic pressure of the extremity at that level. It varies between 90 and 60 millimetres of mercury in an extremity of which the toes are not edematous, not cyanotic, not ulcerated and not gangrenous. When the foregoing conditions exist, 40 millimetres of mercury should not be exceeded at first, although with later improvement the pressure can be gradually raised. The duration of the venous compression is determined by the appearance of a rubor; this occurs in from one to two minutes when pressures of from 60 to 90 millimetres of mercury are used. The duration of the release should exceed that of the compression; together with the one minute of elevation, which can be kept constant, it should last twice as long as the compression. Thus two minutes of compression require four minutes of release, out of which three minutes are spent in the horizontal position and one minute in the elevated position. The elevation can be active, but it is preferable to lift up the leg with the help of a pulley. Thus in the average case a cycle is completed in six minutes; two minutes' compression, three minutes' release and one minute elevation. When the circulatory embarrassment is more pronounced, one minute compression will readily produce a rubor and is followed by one minute release and one minute elevation—a cycle of three minutes. Ordinarily thirty minutes of this vascular exercise in the

morning and thirty minutes in the evening are prescribed. The method is flexible and readily adaptable to the patient's needs. Should it be painful or uncomfortable, either the pressure or the duration of the individual cycle has to be adjusted in order to obtain maximum benefit. When the patient is very ill, a relative or a nurse may inflate and deflate the cuff and lift the leg.

Fractures of the Neck of the Femur.

M. S. HENDERSON (*Archives of Surgery*, September, 1937) describes an internal fixation method for treating fractures of the neck of the femur, in which a lag screw is substituted for the Smith-Petersen nail. In the series of cases treated the results were much better than were obtained in similar series treated by conservative methods, in which the patient often experiences pain, discomfort and loss of morale during convalescence, while not a few have died. In the method used the danger of pulmonary embolism is decreased because the patients can be moved about early. In spite of these favourable results there is an array of objections to its use, including the difficulty of accurate insertion, a difficulty which has led to the introduction of numerous gadgets and instruments, all of which may increase the possibility of infection. This difficulty renders it essential that the operation should be done only in a properly equipped hospital and by an experienced surgeon. The nail does not always remain where it is put because of absorption of bone around it or because of shortening of the neck of the femur from absorption thereof. It takes at least three months for bony union to occur, and even with perfect internal fixation weight-bearing should not be permitted until radiological examination reveals bony union. The author concludes that special selection of cases is necessary and that if internal fixation is used indiscriminately in all cases of fracture of the neck of the femur, failures and disasters will follow and will tend to discredit the method, which is too recent to allow final evaluation to be made. When ideal conditions are absent it is better either to refer the patient to a centre where the exacting conditions can be fulfilled or to treat the patient by such conservative measures as those with which the surgeon is familiar. There is no urgency to carry out internal fixation, and some surgeons prefer to wait for three weeks before operating.

Diverticulosis of the Colon.

E. J. KOCOUZ (*American Journal of Surgery*, September, 1937) has studied seven thousand consecutive autopsies and found that 3.58% of the bodies of persons over forty years of age showed diverticulosis, while in 0.15% there was some complication thereof which had caused the death of the patient. Most of the diverticula were found in the sigmoid colon, while all

those which had produced complications were in the sigmoid. The incidence of carcinoma of the colon, essential hypertension or peptic ulcer was not greater in the group of patients with diverticulosis of the colon than in the entire series, but the incidence of lesions of the gall-bladder in patients over forty years of age was doubled in those with diverticula, and this is in keeping with the clinical impression that a relation exists between abnormal colon function and pathological change in the gall-bladder.

Hyperthyroidism.

G. CRILE AND G. CRILE, junior (*American Journal of Surgery*, September, 1937) discuss hyperthyroidism in children under five years of age, and conclude that it is no different from the same condition in the adult, and that thyroidectomy is the treatment of choice. Exophthalmos and tachycardia are always present, and the former is an important factor, since its development may represent an irreversible change; further, since early and adequate operation usually prevents the development of exophthalmos, it is extremely important to make accurate measurements of the position of the eyes if conservative treatment of hyperthyroidism in a child is to be tried. At the first distinct sign of the development of progressive exophthalmos subtotal thyroidectomy should be performed. Thyroidectomy presents no greater hazard in a child than in an adult, and since children are excellent operative risks, one-stage thyroidectomy can usually be performed without danger.

The Injection Treatment of Inguinal Hernia.

E. L. SUGAR (*Western Journal of Surgery, Obstetrics and Gynecology*, September, 1937) discusses the injection treatment of inguinal hernia and presents the detailed technique. It may be used in all cases regardless of the age of the patient or the size of the hernia, with the exception of irreducible hernia, sliding hernia and hæmophilias. The method has proved successful with 1% of recurrences in 150 cases over a period of three years. The average case required twelve injections, two injections being given each week.

Fascial Operations for Hernia.

C. G. BURDICK, D. H. M. GILLESPIE AND N. L. HIGINBOTHAM (*Annals of Surgery*, September, 1937) have studied the end results of 1,485 operations for hernia in which fascial sutures were used. They find that infections are more common in hernia repaired with fascial than in those in which other forms of suture material are used. In the authors' series the incidence of infection was lowest in the group repaired with autogenous fascia (7.9%); in those repaired with homologous fascia it

was 12.8%, and when ox fascia was used the percentage was 12.1. The authors regard the number of recurrences as discouraging, although they point out that fascial repair was reserved for only the more difficult types of hernia; they had hoped for more encouraging results. The introduction of a large needle through the transversalis fascia and Poupart's ligament often left a weak spot which predisposed to a recurrence. Because in many of the cases in which a second operation had to be performed the authors were unable to find any evidence of the previously used fascial sutures, they conclude that the theory of fascial sutures for hernial repair is based on an erroneous principle.

Thyroid Disease.

W. B. PATTERSON, H. F. HUNT AND R. E. NICODEMUS (*Western Journal of Surgery, Obstetrics and Gynecology*, September, 1937) investigated the hypercholesterolemia of pregnancy and its possible relation to thyroid disease in the fetus and the offspring. They consider that most thyroid disease is congenital. The conclusions were that the hypercholesterolemia of pregnancy is due to a subclinical hypothyroidism which becomes exaggerated owing to the increased metabolism for pregnancy; that the hyperthyroid mother absorbs fetal thyroxin, producing fetal thyroid hyperplasia; and that the fetal thyroid hyperactivity and hyperplasia during development lead to permanent thyroid damage, which in later years, depending on the iodine supply and the physiological demand, may lead to clinically evident thyroid disease.

Scleroderma Simulating Carcinoma of the Breast.

MARK COLEMAN (*The British Journal of Surgery*, July, 1937), writing from University College Hospital, London, describes two cases of localized scleroderma affecting the skin of the breast. In both instances the condition resembled malignant disease so strongly that operation was performed. In one instance an exploratory incision was made and the affected area was excised, and in the other a local biopsy was performed. In the first instance the patient was a married woman aged thirty-two years, and in the second a married woman aged forty years. The author describes the histories in some detail, and he lays stress not only on the difficulty presented in diagnosis, but also on prognosis from the point of view of the patient. He points out that, unlike the generalized type, circumscribed scleroderma is not accompanied by general symptoms or vasomotor phenomena, and there are usually no associated subjective symptoms. The fully developed lesion, particularly if multiple, may be readily diagnosed. Its characteristics are stated as being an ivory or silvery pigmented patch with a violaceous halo. In the two

cases reported by the author this atrophic stage had not been reached. The author points out that the surgeon is concerned principally with the differentiation from cancer in the possible forms of changes in the skin overlying a growth, or cancer en cuirasse in a primary case, or around the scar following mastectomy. The skin changes in scleroderma are localized and well defined; distinct nodules in the skin are never present; and no mass can be palpated in the breast. No age is exempt from scleroderma, but adults are more often affected, and more than three-quarters of the cases described in the literature have occurred in females, chiefly between the ages of twenty-one and forty years. When differentiation from cancer remains in doubt, biopsy must be performed.

Pulmonary Embolism.

ROBIN PILCHER (*The British Journal of Surgery*, July, 1937) has made a statistical investigation of the incidence of pulmonary embolism in twelve London hospitals in the decade 1925-1934. During this period 911,215 patients were admitted to hospital, there were 46,562 deaths, and 36,145 post mortem examinations were held. In all, 731 cases of fatal pulmonary embolism were discovered. Diagnosis was proved in every instance by post mortem examination. The author believes that during the period studied a considerable number of cases escaped diagnosis, and that the incidence is higher than is generally recognized. He found no evidence to support the idea that pulmonary embolism has any seasonal or epidemic incidence. In 573 cases there was a history of trauma, in 158 there was none. In the author's opinion the predominance of embolism due to trauma is partly due to the high proportion of patients suffering from surgical conditions who are admitted to hospital. According to a rough approximation made by him, the incidence is 0.105% in surgical and 0.064% in medical cases. Immobilization of the patient is a more important factor in aetiology than is the nature of the illness or of the trauma. The "supposed primary thrombosis" was found in the veins of the right leg more commonly than the left in traumatic cases. The author finds an association between right-sided injuries or operations and thrombosis in the veins of the right leg. This has not been observed, however, in post-operative thrombosis not followed by fatal embolism. The age incidence reaches a maximum in the five-year period 55 to 59, both for traumatic and non-traumatic cases. In non-traumatic embolism the numbers of males and females are equal. In traumatic embolism females are in the majority. Owing to lack of information about the sex and age of the hospital population the author was not able to estimate the true sex or age incidence.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Prince Alfred Hospital, Sydney, on June 3, 1937. The meeting took the form of a series of clinical demonstrations by members of the honorary staff. Parts of this report appeared in the issues of October 2 and October 9, 1937.

Pathological Specimens.

DR. CLEMENT CHAPMAN showed three specimens illustrating the value and interest of routine pathological examination in gynaecology.

In the first case total hysterectomy and double salpingo-oophorectomy had been performed on a woman suffering from *fibrosis uteri*. Pathological examination revealed a small tumour of the ovary. This proved to be a very early carcinoma.

In the second case the patient had been operated upon for *fibrosis uteri* and the appendix had been removed. Pathological examination revealed a carcinoma of the appendix. Two years later no sign of a recurrence had appeared.

In the third case, in the performance of an operation for *fibromyoma uteri*, a small, hard, round tumour had been found in the right Fallopian tube. This proved on section to be an old ectopic tubal gestation. This showed that some ectopic gestations cured themselves.

Dr. Chapman also showed microscopic sections illustrating the more recent advances in the classification of the solid malignant tumours of the ovary. He showed a granulosa-celled tumour and two types of arrhenoblastoma, also a section of dysgerminoma and one of the very rare and interesting Brenner tumour.

Hepatomegaly.

DR. J. H. HALLIDAY showed a woman, aged thirty-seven years, who had been admitted to hospital on June 12, 1935. She had suffered from pains in the limbs and back for a period of six months, great thirst for six weeks and cough for six weeks. The pains at times had been very severe; they occurred first in the lower limbs and later in the arms, and finally they radiated round the body from back to front, at the level of the costal margin. Some loss of weight had occurred since the onset of the pains. In 1919 she had been subjected to appendicectomy, in 1921 hysterectomy, and in 1930 to an operation for adhesions, when a tumour of the colon had been discovered and abdomino-perineal resection of the bowel had been performed.

Examination revealed that the pupils were unequal and irregular and of the Argyll-Robertson type. Knee and ankle jerks were absent. There was some impairment of pain sensation over the ulnar border of the left arm and the anterior aspects of both legs and knees. There was a left iliac colostomy. The results of a blood count were within normal limits. The blood and cerebro-spinal fluid gave a triple positive reaction to the Wassermann test, and the blood reacted to the Kline test. X ray examination of the lungs revealed no abnormality. There was no evidence of metastases in the lumbar vertebrae or pelvis. Anti-syphilitic treatment was then instituted; it was continued in the out-patient department for six months, when the patient left Sydney. She was not seen again until April, 1937. She had had no further anti-syphilitic treatment during this time (twelve months). The history then given was that she had remained well until two weeks previously, when, after some initial nausea, vomiting and anorexia, she had noticed that her urine was becoming dark and her skin yellow. She was admitted to hospital and was still under observation at the time of the meeting. The jaundice had increased in intensity. There had been loss of weight. The liver had increased in size and, at the time of the meeting, reached nearly to her umbilicus.

X ray examination of the stomach and duodenum revealed no abnormality, and no calculus was found in the gall-bladder on plain radiography. There was no reaction to the Casoni test. Coagulation time and bleeding time were normal, and there was no abnormal fragility of the red blood cells. There were a direct positive biphase reaction and an indirect positive reaction to the Van den Bergh test. The urine contained bile salts and pigments.

Dr. Halliday said that he showed the patient on account of the clinical interest of her condition and for suggestions regarding diagnosis. It was probable that the condition was due to metastatic deposits in the portal fissure. This interpretation depended on the correctness of the diagnosis of the original tumour of the colon. The interval of seven years between the operation and the onset of the present manifestations was somewhat unusual in a patient of her age. It was difficult to visualize the whole picture in terms of her syphilitic infection.

Granulopenia.

Dr. Halliday's second patient was a woman, aged twenty-four years, who had been admitted to hospital on May 24, 1937, gravely ill, with a provisional diagnosis of septicæmia. She had suffered from weakness and lassitude and cough for six months, and recurring ulceration of the mouth for five months. She had been confined on February 12, 1937. A number of teeth had been extracted under general anaesthesia three days before admission to hospital. Some hours after the extraction the patient had a rigor, which was followed by high fever. Multiple ulcers at the site of the extractions and round the remaining teeth developed quickly and the patient became seriously ill.

The patient was lethargic; her face was sallow and sunken, and she had a persistent soft cough. The temperature was 40° C. (104° F.) and the pulse rate was 130 and the respiration rate 20 per minute. The mucous membranes were blanched and there were numerous grey sloughing ulcers present on the gum margins. The breath was very offensive. There were no other abnormal findings of importance. She was given an intravenous injection of glucose and saline solution and 20 cubic centimetres of "Prontosil" solution intramuscularly.

On May 25, 1937, the red blood cells numbered 1,650,000 per cubic millimetre. No macrocytes were seen. The hæmoglobin content of the blood was 4.8 grammes per 100 cubic centimetres (33%). The colour index was 1.03. The leucocytes numbered 1,850 per cubic millimetre, the neutrophile cells being in the proportion of 44% and lymphocytes 54%. There was a shift to the right in the neutrophile cells. No organisms were cultured from the blood. *Streptococcus viridans* and *Streptococcus hemolyticus* were cultured from the lesions of the mouth. Vincent's organisms were not found. A further injection of "Prontosil" solution was given intramuscularly. The patient was given a transfusion of 700 cubic centimetres of whole blood. On May 26, 1937, there was an improvement in the general condition and the temperature was falling. An intramuscular injection of two cubic centimetres of anæmin was given. On May 27, the red blood cells numbered 2,320,000 per cubic millimetre; the hæmoglobin value was 46% (67 grammes per 100 cubic centimetres); the colour index was 1.0. The leucocytes numbered 1,200 per cubic millimetre, neutrophile cells being in the proportion of 38%, lymphocytes 45%, eosinophile cells 10%, and monocytes 2%. Six of the neutrophile cells were band forms and 32 of the lymphocytes were segmented. At this stage the administration of a daily dose of pentnucleotide was commenced. On May 31 the leucocytes numbered 2,900 per cubic millimetre, 55% being neutrophile cells, 33% lymphocytes, 7% monocytes, and 3% neutrophile myelocytes. Among the neutrophile cells there were eight band forms. An occasional macrocyte was seen. On May 31, 1% of the red cells were reticulocytes. On June 2, the red cells numbered 2,660,000 per cubic millimetre and the leucocytes 4,050.

Dr. Halliday said that the disturbance of the hæmopoiesis was in the bone marrow itself, and both red and white cell formation had been gravely affected. The history suggested that the anemia had first manifested itself during pregnancy; it was possibly of the so-called

pernicious type of pregnancy. This anaemia had persisted during the two and a half months following parturition. The accompanying leucopenic state was to be considered in conjunction with the recurring mouth ulceration. The acute sepsis following removal of her teeth might have caused further depreciation of the marrow function and have accounted for the rapid onset of the signs and symptoms. Transfusion had been followed by general improvement, although a further fall in the numbers of leucocytes to a dangerous level had occurred on May 25. The administration of pentnucleotide had been followed by a great improvement in the white cell count. There had been no reticulocytosis as yet. Gastric analysis had not been made. The rôle of pentnucleotide in granulopenia was still doubtful, and in this case the appearance of young neutrophilic cells before the administration of this drug suggested that recovery of the marrow function had already begun. All observers agreed that it was necessary to give this preparation at the earliest stage possible in acute granulopenic states.

Dr. Halliday also showed a man, aged forty-six years, whom he had first seen at the Royal Prince Alfred Hospital on November 9, 1936. In June, 1936, he had suffered a sudden attack of pain over the left side of the chest anteriorly while at work. This pain had subsequently recurred only with effort. He had also suffered from weakness, giddiness and palpitation, also pronounced after exertion, and some swelling of the feet. He had had several fainting attacks since the onset of the acute symptoms. He stated that he had been pale for some years. He had had typhoid fever at the age of eight years. Infected teeth had been extracted in October, 1936.

Examination revealed pronounced pallor of the skin and mucous membranes. No enlargement of the spleen was detected. Examination of the blood revealed macrocytosis. The red blood cells numbered 1,480,000 per cubic millimetre; the haemoglobin value was 35% (5.1 grammes per 100 cubic centimetres), and the colour index was 1.25. The white blood cells numbered 3,350 per cubic millimetre, 69% being neutrophilic cells, 23% lymphocytes, 6% monocytes, and 2% eosinophilic cells. Analysis of the gastric contents revealed a normal amount of acid. There was no reaction to the Wassermann test. The patient had been treated with liver and iron since the onset of acute symptoms.

He was admitted to hospital on December 16, 1936, and given a transfusion of whole blood. He was then treated with large doses of liver extract ("Campolon"), ten cubic centimetres being given intramuscularly every fourth day. There was little or no improvement in the blood, and the reticulocyte count never exceeded 2% and was generally less than this. Repeated blood counts were done, and the red cells at one time exceeded 2,530,000 per cubic millimetre (this a few days after the second transfusion). Further blood transfusions were given on January 22 and February 23, 1937. The red cell count had since fallen to 1,000,000 per cubic millimetre.

X ray examination of the stomach and duodenum revealed no abnormality. The basal metabolic rate was +1%. A blood transfusion was given again on June 3, 1937.

Dr. Halliday said that this was a case of severe hyperchromic anaemia with associated leucopenia and normal gastric secretion, in which there had been no response to intensive liver therapy. The only helpful procedure had been repeated blood transfusion. There was no history of exposure to radium or chemical poisons, nor evidence of any parasitic infection. He suggested that there was a progressively increasing failure of bone marrow function of unknown aetiology, which was producing a severe anaemia of the aregenerative or aplastic type.

Pathological Exhibits.

Specimens from a Case of Melanotic Carcinoma of the Skin of the Back.

Dr. H. R. G. POATE showed specimens from a male patient, nineteen years of age, who had noticed some itchiness between the shoulder-blades about five months previously; by this his attention was drawn to a small

black mole in this region, not much larger than a pin's head. The itchiness continued, and as a result the mole must have been irritated, as it grew in size until a few weeks prior to the meeting it was about 0.5 centimetre in diameter. Two weeks previously he noticed two black spots in the skin just above the mole, and a little before this he had noticed a lump in the right axilla.

When the patient was examined a typical melanotic mole was seen to the right of the mid-line, about the level of the fifth thoracic spine, and some seven millimetres in diameter. It was raised about five millimetres above the skin level and was rounded and smooth-surfaced. Another small black mole was seen two centimetres above this, and a third smaller one 2.5 centimetres higher. A hard, enlarged gland, 1.5 centimetres in diameter, was palpable in the lower part of the axilla.

At operation on May 11, 1937, very free excision was made of the mole-bearing skin area, and a complete dissection of the axillary glands was performed.

Specimen of Ewing's Sarcoma Affecting the Calcaneus.

Dr. Poate next showed specimens from a boy, aged sixteen years, who had sustained a slight injury to the left ankle some two years previously. Since then he had had a swelling on the medial aspect of the calcaneus, which varied from time to time in size and painfulness. He was thought to have periostitis and was treated accordingly, but as the swelling and pain increased it seemed that the bone itself must have been injured, and he was sent for X ray examination. The report suggested Ewing's sarcoma, and after consultation he had a course of deep X ray therapy. The condition was apparently relieved for a few months, but then relapsed to the old state of affairs.

In the few weeks preceding the meeting, however, a marked change had occurred; the swelling had become greater than ever before, with increased pain and disability. The overlying skin was hot, had become dusky in colour, and was very tender. The swelling seemed fluctuant, and a diagnosis of osteomyelitis was made. An incision was made and some thick creamy material exuded from the tissues; there was abundant soft new bone formation, but no necrosis. The fluid and some tissue were sent for pathological examination.

Dr. Poate then quoted the pathological report made by Dr. Davies, which was as follows:

Macroscopic: An irregular flattened piece of tissue from the ankle region.

Microscopic: The tissue from the ankle region is largely necrotic and in places contains some spicules of bone. In parts which are not necrotic there is infiltration by tumour growth. The cells of this are closely packed together but, where more separated, are mainly round, with large nucleus and scanty cytoplasm. The nucleus has well-marked nuclear membrane and large nucleoli with also a moderately heavy chromatin network. There is some dense fibrous tissue reaction around this, but there is no tendency to form new bone. Occasional cells have two nuclei, and some nuclei are larger than others, yet irregularity is not a marked feature. The appearances are characteristic of Ewing's sarcoma of bone.

I have shown these sections to Professor Inglis, who is in general agreement with this report.

A diagnosis was made of Ewing's sarcoma of the ankle region.

The patient's chest was found to be clear by X ray examination, and, as there were no glands palpable, amputation was advised and acceded to by the patient, who wished to be relieved of a painful affliction, although no prospect of ultimate cure was held out.

Total Thyroidectomy in Males.

Dr. Poate then showed three male patients who had been subjected to total thyroidectomy. The first, a man aged thirty-four years, had suffered from multiple adenomata. He had first noticed a lump in his neck at six years of age. It had gradually increased in size, until

at twenty-two years of age he had two large swellings, the size of goose eggs, on either side of the lower part of the neck. In 1925 hemithyroidectomy for the swelling on the right side had been performed; since then the swelling on the left had further increased in size and had pushed across the mid-line. He experienced interference with breathing on bending down to work, and wished for relief. There were no symptoms of toxicity, but he rather presented the picture of a low-grade myxœdema, and the basal metabolic rate was -14%.

Upon examination he was found to have a large adenoma in the mid-line, some four centimetres in diameter, and another larger mass in the left side of the neck. At operation on April 13, 1937, no normal thyroid tissue could be found on either side, and the whole large adenomatous mass was removed *in toto*.

The patient made an uneventful recovery, and when seen recently said that he felt better than he had been for years. There was very little alteration in his facies, but he was tending towards the typical myxœdemic appearance. The basal metabolic rate was -22%, so he was given 0.032 gramme (half a grain) of thyroid substance three times daily.

Thyreotoxicosis with Persistent Auricular Fibrillation.

Dr. Poate's next patient was a male, aged fifty-six years, who had suffered from thyreotoxicosis with persistent auricular fibrillation. He had been quite well until some eighteen months previously, when he became subject to attacks of severe palpitation of a paroxysmal nature. Associated with these he had distressing breathlessness and swelling of the ankles. These attacks would last as long as two weeks, with short periods of remission. He had become very nervous and tremulous, exophthalmia had developed and he had lost two stone in weight. He was treated in the medical wards for several months without the fibrillation being relieved. The apex beat of the heart was in the anterior axillary line, and the right border of the heart was two centimetres to the right of the sternum. Systolic murmurs were audible at the base, and the pulse deficit was approximately 15 per minute. The apex rate was approximately 130 per minute most of the time, although the patient was kept in bed. There was a moderately enlarged thyroid gland, with moderate exophthalmos and pronounced tremor.

Estimations of the basal metabolic rates were interesting. On January 18, 1937, the rate was +23%; on January 24 it was -1%; on February 4 it was +13%; on February 10 it was -9%; on February 16 it was +16%; on February 24 it was +20%.

On March 6, 1937, the patient was operated upon, paraldehde *per rectum* and local anæsthesia being used, and total thyroidectomy was carried out. Fibrillation continued for twelve days, when the pulse became regular but was rapid (the rate was 160, and three days later it dropped to 75). Up to this time he had received regular dosage with digoxin. His pulse rate then jumped to 140, varying to 160. An electrocardiogram revealed auricular flutter with varying ventricular response. Until his discharge from hospital on April 24, 1937, the pulse rate remained about 140, being sometimes regular and at other times irregular. Quinidine did not correct the rhythm.

On May 25 his basal metabolic rate was -22% and he had put on two stone in weight since the operation. He still had a rapid pulse, but said that he felt very well indeed, better than he had felt for the past two years. He showed no evidence of myxœdema, but he would be kept under observation for some time.

Dr. Poate's next patient had suffered from the same condition. He was fifty years of age and had had palpitation, tremor, lassitude, sweating and breathlessness for twelve months, in which time he had lost one and a half stone in weight. His basal metabolic rate was +25%, and his weight was seven stone two and a half pounds. There was no actual exophthalmos, but the palpebral fissure was widened. He had pronounced tremor and a persistent auricular fibrillation, but no cardiac enlargement. He was given a course of deep X ray therapy and had various medical treatments for five months without any appreciable benefit.

On October 7, 1936, he was operated upon under paraldehyde administered *per rectum* and nitrous oxide-oxygen anæsthesia. Total thyroidectomy was performed. Three weeks later he had a regular pulse rate of 74 and a normal electrocardiogram.

In April, 1937, his basal metabolic rate was -28% and his weight was eight stone six and a half pounds. He had slight flattening of the nasolabial folds and a tendency to the typical myxœdemic facies, although he felt very well. He was treated with 0.032 gramme (half a grain) of thyroid substance three times a day, and was still under observation.

Buerger's Disease.

Dr. B. T. EDYE showed a man, aged thirty years, who three weeks before his admission to hospital had injured the fourth toe of his left foot by dropping a brick on it. Prior to this there were no symptoms. X ray examination revealed no evidence of bony trauma. One week later the toe became red, swollen and painful, and soon numbness and paræsthesiæ became apparent. Three weeks after the original trauma the toe became black and there was a continuous throbbing pain, which became worse when the limb was elevated. At this stage the patient was admitted to the Royal Prince Alfred Hospital with gangrene of the second and third phalanges of the fourth toe. Pain and tenderness were pronounced, and inflammatory œdema was present extending to the mid-dorsum of the foot. The overlying skin was shiny and slightly scaly. There was no pulsation in the posterior tibial, anterior tibial or popliteal arteries. Glycosuria or ketonuria had never occurred. Since the patient's admission to hospital the gangrene had spread to involve the third and fifth toes.

The patient was of Jewish extraction and had smoked six ounces of tobacco per week for several years. Palliative treatment, apart from the administration of morphine, had taken the form of postural exercises and the application of heat, to which the patient was intolerant. At the time of the meeting intravenous injection of hyperonic saline solution (5%) was on trial and appeared to be affording some relief.

Carcinoma of the Colon Occurring at Two Sites and Removed by Two Separate Operative Procedures.

Dr. Edye's second patient was a man, aged sixty-three years, who had suffered for six months from attacks of lower abdominal pain. The pain had been spasmodic, lasting up to five minutes, and doubled the patient up. It had become worse and more frequent. Blood and mucus had been passed occasionally with the stools. There had been no constipation or diarrhoea, and no loss of weight.

On examination the patient's general condition appeared good. There was slight tenderness in the right iliac fossa. Rectal examination revealed no abnormality. Sigmoidoscopic examination revealed a sessile papilloma about 2.5 centimetres (one inch) in diameter, 15 centimetres from the anus, on the posterior wall of the bowel. A portion of this was removed for biopsy, and the report by Professor Welsh stated that the condition was carcinoma *in situ* without invasion, developing from and contrasting with the structure of an otherwise benign papilloma. A barium enema revealed a filling defect of the pelvic colon, probably due to carcinoma.

Operation was performed on April 8, 1935. The abdomen was opened and a typical ring carcinoma of the pelvic colon was resected; an end-to-end anastomosis was performed. Convalescence was uneventful.

An attempt to deal with the malignant papilloma through a speculum was not satisfactory and was considered to be dangerous; it was decided to approach it from the abdomen. The abdomen was reopened and the pelvi-rectal junction of the colon was surrounded with gauze sponges and opened. The papilloma was excised and the opening in the bowel was closed. Recovery was again uneventful. The pathological report on the specimen corresponded with that previously given. Recent sigmoidoscopic examination revealed a perfectly healed scar

with no evidence of recurrence. Dr. Edye pointed out that this case indicated (a) the advisability of carrying out a sigmoidoscopic examination in addition to an X ray examination in all patients suspected of suffering from carcinoma of the colon, and (b) the necessity for considering every reasonable plan of surgical treatment before selecting a method which would leave the patient with a permanent colostomy.

Urethral Calculi Causing Acute Symptoms Twenty-Five Years after Nephrectomy for Calculous Pyonephrosis.

Dr. Edye's third patient was a male, aged fifty-eight years, who, in January, 1912, had had a right nephrectomy for calculous pyonephrosis performed by Sir Alexander MacCormick in the Royal Prince Alfred Hospital. He was readmitted to hospital in March, 1937, with a history of acute symptoms of no more than three days' duration. He had had acute pain, which commenced in the sacral region, but which soon became localized to the lower right quadrant of the abdomen, where it remained. The pain was severe, and forty-eight hours after its onset the patient commenced to vomit. He had suffered from slight scalding on micturition, but had had no frequency. At first he was considered to be suffering from acute appendicitis, but examination of the urine revealed the presence of albumin, blood and pus, and X ray examination revealed large calculi in the position of the residual right ureter.

At operation a right paramedian incision was made and the ureter was approached extraperitoneally. The ureter was greatly thickened and was firmly adherent to adjacent structures. It was excised after being ligated and divided at its distal end, close to the bladder. It contained several calculi and a quantity of thick purulent fluid. The patient made a good recovery.

Recurrent Epithelioma of the Face and Upper Jaw Superimposed on Lupus Vulgaris which had been Treated Successfully by Radiation.

Dr. Edye's fourth patient was a male, aged forty-seven years, who had first been admitted to the Royal Prince Alfred Hospital in December, 1935, with a squamous-celled carcinoma of the right cheek of two years' duration. This tumour was on the site of a patch of *lupus vulgaris* two inches in diameter, which had been present twenty-five years previously and which had healed after repeated treatment by radiation. There were no palpable glands in the neck. Excision of the growth was performed and the patient was discharged from hospital. He was readmitted to hospital in April, 1936, with a recurrence, the tumour being about 2.5 centimetres (one inch) in diameter and situated in the centre of an area of scarring at the site of the previous operation. He was discharged after a course of deep X ray therapy, but returned again in September, 1936, with a tumour 3.75 centimetres by 2.5 centimetres (one and a half inches by one inch) which was attached to bone. A radical operation was performed, which involved not only the local removal of the growth, but also exenteration of the right orbit and removal of the right nasal bone, part of the right ethmoid and the anterior wall of the right antrum. Even this did not check the spread of this epithelioma, and in May, 1937, the patient was readmitted to hospital with a recurrence involving the anterior ends of the turbinate bones and the maxilla. The nasal septum was not involved, but the growth had spread downwards to invade the hard palate and alveolar margin.

On May 13, 1937, resection of the remains of the right maxilla was performed. Dr. Edye said that if there was no further recurrence an attempt would be made to repair the defect in the face and the palate with the assistance of the dental department of the hospital.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal North Shore Hospital of Sydney on June 17, 1937. The meeting took the form of a series of clinical demonstrations by members of the honorary staff.

Wide Propagation of a Cardiac Murmur.

DR. F. GUY GRIFFITHS said that loud cardiac murmurs were not unusual; but few were so loud and so widely propagated as to be heard all over both sides of the chest, the vertex of the head and the sacrum and in the femoral canals.

He showed a female patient, aged twenty-seven years, whom he had shown at two previous meetings of the Branch, on June 8, 1917 (*THE MEDICAL JOURNAL OF AUSTRALIA*, July 7, 1917), and on June 13, 1929 (*THE MEDICAL JOURNAL OF AUSTRALIA*, March 15, 1930). Permission had been asked by Dr. J. Heitz to repeat the first account in *Les archives des maladies du coeur, des vaisseaux et du sang*.

Her history began at the age of six years, in 1916, with slight joint pains; in 1917 she was admitted to the Royal North Shore Hospital of Sydney under Dr. Griffiths's care, suffering from rheumatic fever, mild in the joints, but with gross cardiac dilatation and an extraordinarily loud, rough, systolic murmur, heard not only at the cardiac apex, but over the whole of the chest, right side and left, back and front, all down the spine to the sacrum, in each loin, below the ribs on the right side of the upper part of the abdomen and in the inguinal and femoral canals. Despite this she progressed rapidly, and, except for the murmur, seemed fully recovered, bright and active.

In 1929, twelve years later, the murmur was the same; but she was a little thin and had shortness of breath on exertion, though otherwise she was well.

She was now demonstrated for the third time, twenty years after the first, to members of the New South Wales Branch of the British Medical Association.

She was of good colour but thin; signs of cardiac failure were now manifest—dyspnoea and a little oedema. She was said some months ago to have had some auricular fibrillation. Dr. Griffiths said that it appeared that mitral regurgitation went on to mitral stenosis. Her apex beat was in the fifth left intercostal space, 14 centimetres (five and a half inches) from the mid-line, and there might be heard a loud murmur with a suggestion of crescendo in character. The murmur was propagated as already described but now less intensely. She had no cyanosis and no clubbing of the fingers.

The skiagram of the chest showed a large heart with a special increase in the left auricle. The systolic blood pressure was 125 and diastolic 80 millimetres of mercury. Electrocardiographic examinations on October 21, 1936, and June 23, 1937, revealed auricular fibrillation.

Dr. Griffiths said that after he had shown the patient in 1929 it had been suggested that her case might be one of coarctation of the aorta. He could not agree; but he had then no opportunity to seek evidence for or against. This had now been done. No abnormal anastomoses were to be found; there was no undue flushing of the face, and Dr. K. Vickery, an Honorary Radiographer, had kindly reported that there was no dilatation of the first part of the aorta, and no notching of the ribs was to be seen, nor stenosis (coarctation) of the aortic isthmus, that part of the aortic arch between the left subclavian artery and the insertion of the *ligamentum arteriosum*, but the aorta appeared of normal size.

Coronary Thrombosis.

Dr. Griffiths also showed a man, aged thirty-seven years, who had been admitted to the Royal North Shore Hospital of Sydney on May 6, 1937, with history of pain in the precordium for two months, and increasing dyspnoea on exertion for that time. He had had three attacks of acute pain and dyspnoea during the night before admission. The electrocardiographic record showed changes in the "T" wave characteristic of coronary thrombosis. Since his admission the leucocyte count had varied from 9,000 to 14,000 per cubic millimetre. There was no reaction to the Wassermann test. The blood pressure was 115 millimetres of mercury (systolic) and 80 (diastolic).

Pulmonary Fibrosis.

DR. COTTER HARVEY showed two patients who had suffered from cough, expectoration and pyrexia after partial gastrectomy. X ray evidence was suggestive of pulmonary tuber-

culosis. Repeated examination of the sputum failed to reveal tubercle bacilli.

Dr. Harvey said that he showed the patients because the diagnosis was still in doubt. Against a diagnosis of pulmonary tuberculosis had to be set the facts that the onset had occurred after operation, that the lesion was predominantly basal, and that no tubercle bacilli had been found. It was more probable that the condition was due to a streptococcus and could be called "chronic pneumonitis". The similarity of the history and clinical picture in the two patients was remarkable.

Pneumonokoniosis.

Dr. Harvey also showed a man, aged sixty-six years, who had been a quarryman for thirty-five years. On October 17, 1933, he was found by X ray examination to be suffering from pneumonokoniosis with superadded tuberculosis. His general condition during the four years prior to the meeting had been good.

Dr. Harvey next showed a man, aged seventy-one years, who had been a rockchopper for nine years and a quarryman for ten years. In March, 1926, he was found to be suffering from pneumonokoniosis.

Dr. Harvey said that the interesting feature about this and the preceding patient was the fact that, though both were tuberculo-silicotic, their condition had not deteriorated over a period of some years. (In fact, there was radiological evidence of a healing lesion.) Both had outlived their special pension, and had had to fall back on the invalid pension.

Pulmonary Tuberculosis.

Dr. Cotter Harvey also showed a woman, aged fifty-one years, who had been treated for pulmonary tuberculosis by "injections" in 1922, and was said to have been cured. She had married and had reared two children and had felt well until the previous six months, during which she had had a slight pain in the right side of her chest. Respiration had no influence on the pain. There were no symptoms of pulmonary disease.

The patient was a well-developed, healthy looking woman. No physical signs of pulmonary disease were found.

X ray examination revealed extensive calcareous mottling in the upper lobes of both lungs.

The patient was shown to illustrate a cure or healing of what had apparently been extensive tuberculous disease of both lungs fifteen years previously.

Dr. BRUCE WHITE showed a woman, aged twenty-six years, who had first become ill in January, 1936, when she had a short, dry cough and felt "run down". She suffered from occasional colds on the chest, associated with feverishness. The condition was diagnosed as pulmonary tuberculosis about June, 1936, and the patient was admitted to Thirlmere Sanatorium in July, 1937. She remained there for nine months, during which time she felt well. Her weight increased by 6.3 kilograms (one stone). She had received general treatment only. At the time of the meeting she was very well and had no symptoms. She reacted to the Mantoux test.

The patient's two sisters probably had pulmonary tuberculosis, and it was thought that she was the possible source of their infection. The comment was made that she had had some symptoms suggestive of pulmonary disease, and the radiological appearances suggested the adult type of lesion.

Ranke's Primary Complex.

Dr. White next showed a woman, aged twenty-two years, a sister of the preceding patient, who had had no symptoms to suggest any pulmonary disease. She had been examined radiologically as a contact and sent to Thirlmere Sanatorium, where she had put on 6.3 kilograms (one stone) in weight as a result of sanatorium regimen.

X ray examination, made in June, 1936, revealed a perihilar infiltration on the right side. In the last skiagram, taken on March 30, 1937, very little infiltration was to be seen. Dr. White regarded this pulmonary infection (revealed radiologically) as a hilum flare or Ranke's primary complex, the radiological shadow probably being evidence of a non-specific infiltration on a specific tubercu-

lous soil—possibly an allergic phenomenon. The condition present might also be regarded as epituberculosis or the "acute benign" type.

Dr. White also showed a female patient, aged nineteen years, a sister of the two preceding patients. Radiological evidence of pulmonary infection had been found about June, 1936. She was sent to Thirlmere Sanatorium, where, during a period of nine months, she gained 4.05 kilograms (nine pounds) in weight.

Radiological examination in June, 1936, showed increased mottling in the left apical region. This had very nearly cleared up by March, 1937. Dr. White considered that this girl's lesion was acute benign tuberculosis or Ranke's primary complex.

Spontaneous Pneumothorax.

Dr. White's next patient was a man, aged twenty-four years, who had been stricken suddenly with severe pain in the left side of the chest. He had sought advice because two members of his household had recently died of "heart disease", and he was afraid of this malady. At the end of ten days he complained of a "heavy feeling" in his chest. It was ascertained that he had previously had an attack of pleurisy on the right side and that he was frequently subject to what he termed "bronchial colds". X ray examination made ten days after the onset of symptoms revealed a partial pneumothorax with no apparent gross pulmonary lesion.

Horner's Syndrome due to Tumour.

Dr. DOUGLAS ANDERSON showed a woman, aged forty-five years, who had the physical signs of obstruction of the left subclavian vein, of recent onset, and of interruption of the left sympathetic trunk in the root of the neck, of many years' standing. The patient said that she had had a goitre for nearly thirty years. At the time of the meeting she had a firm fixed swelling like a low-lying left lobe of the thyroid gland, displacing the larynx to the right, and a tumour that could be demonstrated by percussion in the superior part of the mediastinum to the left of the mid-line.

Tracheobronchial Lymphoglandular Enlargement.

Dr. Anderson also showed a girl, aged twenty-one years, suffering from Hodgkin's disease. Dr. Anderson said that he showed the patient because of the signs of massive enlargement of the tracheobronchial lymphatic glands, namely, bronchial breath sounds, bronchophony and whispering pectoriloquy over the first and second thoracic spaces (d'Espine's sign) and paravertebral dullness to percussion.

Ovalocytosis.

Dr. Anderson also showed films of the blood of a woman, aged sixty-four years, who had come into hospital on account of arthritis of the hands. She had been found by Miss D. Goldsmid, when she was making a blood count, to have ellipsoidal red blood corpuscles. Dr. Anderson said that the condition of ovalocytosis was not pathological; the abnormality tended to run in families. But this patient's only surviving relatives lived in a remote part of Tasmania. Less than 100 cases had been reported. A film of the blood of *Camelus dromedarius*, which also possessed ellipsoidal red corpuscles, was shown for comparison.

Dislocation of the Lens.

Dr. TEMPLE SMITH showed a girl, aged sixteen years, with congenital dislocation of both lenses. The lower edge of each lens appeared on ophthalmoscopic examination as a half moon across the lower edge of each pupil. The patient's visual acuity, aided by a vertical convex cylinder, was $\frac{6}{60}$. It was not proposed to subject her to operation.

Thyreoidectomy.

Dr. H. HUNTER JAMIESON showed five patients who had been subjected to total thyreoidectomy. The method employed had been termed "stealing the thyreoid". Dr. Jamieson said that when this method was used the patients were thoroughly investigated and their basal metabolic

rates determined while they were out-patients. They were admitted to hospital two weeks prior to operation and told that operation would be in three weeks. They were completely isolated from the rest of the patients. Lugol's iodine solution, in a dose of 0.4 cubic centimetre (ten minims), and potassium bromide, in a dose of 0.6 gramme (ten grains), were given every four hours for two weeks prior to operation. More or less could be given, depending on the pulse rate. In some cases it was found necessary to give 0.015 gramme (one-quarter of a grain) of "Luminal" every four hours as well until the pulse rate slowed sufficiently. During the first week the patients were examined by the anaesthetist (Dr. McCulloch) and weighed. During the second week a spirit dressing was applied to the neck and saline solution was injected *per rectum* each morning. This was done merely to deceive the patient. On the morning of operation, instead of the saline solution, "Avertin", in a dose of 0.9 milligramme per kilogram of body weight, was injected *per rectum* and the usual pre-operative skin preparation was carried out. As soon as the patient became unconscious he was taken to the operating theatre and anaesthesia was induced with nitrous oxide and oxygen. In Dr. Jamieson's series bilateral thyroidectomy was done in each case, and no patient caused the anaesthetist or the surgeon the slightest degree of worry. On the patient's return to the ward, Lugol's iodine solution, in a dose of 4.0 cubic centimetres (one drachm), in saline solution was injected *per rectum*. The patient was given water and sips of well-sweetened whey; glucose in saline solution was given *per rectum* for the first twenty-four hours. Bromides and Lugol's iodine solution were given in gradually decreasing doses for seven to fourteen days.

None of the patients had had the slightest idea that he was to be operated on at the chosen time, and it had been an immense relief to each one to realize that the much-dreaded operation was over without their having known anything about it. Patients were usually kept in bed for fourteen to seventeen days, and discharged twenty-one days after the operation.

(To be continued.)

NOMINATIONS AND ELECTIONS.

THE undermentioned has been elected a member of the New South Wales Branch of the British Medical Association:

Dance, George Barrington, M.B., B.S., 1933 (Univ. Sydney), Ocean Island, Central Pacific.

Research.

PASPALUM ERGOT.

In our issue of November 6, 1937, under the heading of "Current Comment" an article was published entitled "Gangrene Caused by Ergotamine". The article concluded with the following sentence:

In certain coastal areas of New South Wales a form of ergot attacks *paspalum* grass. It would be of great interest and value to have the pharmacology of this species completely elucidated to ascertain how it compares with the pharmacopoeial species.

It came to our knowledge that certain work on this subject has been done by Burroughs Wellcome and Company Limited. In conversation with a representative of the firm we find that at the beginning of 1936, when *paspalum* throughout New South Wales, especially the coastal areas, was badly infested with ergot, an ample representative sample was obtained of the mature ergot and examined by Burroughs Wellcome and Company Limited, with the following result:

The amount of alkaloid calculated as ergotoxine is not more than 0.01%. This is much less than the proportion present in the official ergot of rye. The B.P. minimum is 0.05%, and good commercial ergot contains up to 0.2%. The *paspalum* ergot is, therefore, of no commercial value.

The report of the investigation goes on to state that samples of *paspalum* ergot from South Africa have been previously examined and found to contain no alkaloid. Nevertheless, cases of poisoning by this ergot have been reported in the Argentine and in Natal. In "Ergot and Ergotism", by Barger, it is described as particularly poisonous. The proportion of alkaloid may perhaps vary with the degree of maturity.

Cattle eating ergot-infested *paspalum* in New South Wales last year, whilst finding it somewhat distasteful, were only slightly affected. The question of variation of alkaloid with degree of maturity is being further considered.

From the above it would appear that pharmacologically *paspalum* ergot compares most unfavourably with the pharmacopoeial species and is practically useless.

Correspondence.

INFLAMMATORY STRICTURE OF THE RECTUM.

SIR: Through the kindness of Dr. G. S. Hayes, of the Department of Public Health, Queensland, a limited supply of Frei antigen prepared after the method evolved by Dr. Arthur Grace, of New York, has been made available so that the two cases of inflammatory stricture of the rectum reported in your issue of September 18, 1937, might be adequately tested. In each case the intracutaneous test yielded a positive reaction.

Case I.—C.B., female, aged thirty years. Intradermal injection of 0.1 cubic centimetre of Frei antigen at 10.30 a.m. on October 11, 1937.

Inspection after twenty-four hours: Around site of antigen injection is an erythematous area about three-quarters of an inch in diameter, in centre of which appears to be a small raised patch about size of a small match head. ? papule. The control shows no erythema and appears reduced in size to about half. There is a bluish red discoloration present.

Inspection after forty-eight hours: Papule 8 m.m. diameter appeared 48 hours after injection of 0.1 c.c. of Frei's antigen. Control practically disappeared, leaving only a faint bruised area after 48 hours.

Inspection after seventy-two hours: Control disappeared. Papule more distinct—7 m.m. Erythematous area around papule decreased.

October 14, 1937.

E. J. Brooks.

Case II.—R.H.G., male, aged twenty years.

Papule 5 m.m. in diameter after intradermal injection of 0.1 c.c. of Frei antigen. This persisted for five days. The control cleared in forty-eight hours.

October 9, 1937.

Eva A. Shipton.

Yours, etc.,

229, Macquarie Street,
Sydney,

RUTHERFORD DARLING.

October 13, 1937.

THE GENITO-ANO-RECTAL SYNDROME (LYMPHOPATHIA VENEREUM).

SIR: In your issue of September 18, 1937, Dr. Rutherford Darling reported two cases of inflammatory stricture of the rectum, which he had diagnosed as due to the virus of *lymphogranuloma inguinale*.

In Queensland I had been observing this condition mainly in the form of climatic bubo in the venereal clinics, and occasionally as esthiomène in prostitutes in the lock hospital.

In 1935 I had some Frei antigen prepared from a typical case of climatic bubo, but as a suitable case did not present itself for testing the antigen for over six months, it was destroyed. More recently, Dr. Bruce Barrack, of Brisbane, who had just returned from America, drew my attention to the work of Dr. Arthur W. Grace, of New York, who had succeeded in perfecting an antigen for the Frei test by inoculating the disease into the brains of mice. He found that not only did this provide a readily available means of procuring supplies of antigen, but that the antigen was very uniform and kept excellently.

I therefore wrote to Dr. Grace and through his kindness and the courtesy of the Lederle Laboratories, who were preparing his antigen on a commercial scale, I was able to procure some of this lymphogranulomatous mouse brain antigen. Investigations with some of our cases were about to commence when Dr. Rutherford Darling reported his cases. He very kindly consented to try some of this antigen on these cases with definite positive reactions, as reported elsewhere. (See his letter in this issue.)

As this is probably the first time a positive Frei test has been reported in this country it is worthy of some notice.

The disease has many aspects and synonyms: climatic bubo, esthiomène, *lupus vulvae*, paradenitis bubo, inflammatory stricture of the rectum, Nicholas Favre disease, the genito-ano-rectal syndrome, *lymphopathia venereum*, *lymphogranuloma inguinale*, et cetera.

The important point is that the disease has now been definitely proved in Australia (though previously reported on clinical evidence) that the gynecologists, proctologists and venereologists must be seeing cases, that it is now possible to prove the infection by a readily available antigen, that the reaction persists indefinitely, and finally that care should be taken that the skin condition of *granuloma inguinale* or *granuloma venereum* is not confused with this infection.

I suggest that the terms *lymphopathia venereum* and genito-ano-rectal syndrome are the best to employ in speaking of this infection.

Yours, etc.,
G. S. HAYES.

William Street,
Brisbane,
November 1, 1937.

COMMON PROBLEMS IN GENERAL PRACTICE.

SIR: In his letter of the twelfth ultimo Dr. Loughran suggests that it would be inconsistent for me to think that the council should recommend a legal change in the present position with regard to abortion without the general practitioners being consulted as to their opinions on this matter.

He bases this on the fact that I did not protest against either Dr. Derham's or Professor Marshall Allan's remarks during the discussion which followed the paper.

In justification of myself, I would like to say that I should not be held as being in agreement with everything said by others during this discussion simply because I did not refute it in my few remarks at the end. These were necessarily limited in view of the lateness of the hour.

I would like to assure Dr. Loughran that I agree most heartily with him in his contention that the general practitioners should have more say in the control and conduct of their affairs; but I think this could be attained if they had a larger representation on the Council of the Victorian Branch. If this were so, Dr. Loughran could rest assured that no recommendations of matters inimical to general practitioners' interests would emanate from such a body without at least canvassing of general practitioners to see what their views were.

In conclusion, I should state that, as I am not a member of the council, I do not know if any action on this matter has been contemplated by it; but my remarks on the subject of the "unwanted pregnancy" were meant purely as a reflection of my thoughts on what has been, to me, a real problem in practice.

Yours, etc.,
G. WINTER ASHTON.

Burke Road,
Camberwell,
Victoria,
November 1, 1937.

THE CAUSE OF TRACHOMA.

SIR: I wrote to Dr. R. Wilson, Director of the Memorial Ophthalmic Laboratory, Giza, Cairo, asking his opinion of the results obtained by Cuenod and Nataf published in *The British Journal of Ophthalmology*. I enclose his reply, which is very informative. It looks as if at last we have found what is the causal agent of trachoma. It does not, however, explain why it is almost universal in Egypt and frequent in Hungary and other European countries. On the other hand, it is rare in England and in Australia, where it was once most prevalent, and is at all events in the eastern portion of Australia steadily disappearing.

It apparently takes something more than the causal agent to produce the disease. The experience of Lieutenant-Colonel Eason and myself in Egypt was that there were certainly not a hundred infections of British troops during the war—probably about fifty—while other forms of ophthalmia were exceedingly common.

Yours, etc.,
JAMES W. BARRETT.
103-105, Collins Street,
Melbourne, C.I.,
October 27, 1937.

Memorial Ophthalmic Laboratory,
Giza, Cairo,
September 26, 1937.

Sir James Barrett,
103-105, Collins Street,
Melbourne, C.I.

Dear Sir James,

Your letter re Cuenod and Nataf's work on trachoma has just arrived. Their last publication is certainly very interesting and looks good. I don't think there can be any doubt that they are working with true trachoma. They know the disease too well to make any mistake about that. They do not use the word pannus, but the text does say on page 314, at the top of the page: "At the end of two months the appearance was unmistakable and showed all the characteristics of trachoma, clinical, microscopical and biomicroscopical." I am sure the pannus is included in the last mentioned.

We shall probably try some experiments here along their lines, but we do not find any other bodies in the epithelial cells of trachoma other than the initial and elementary bodies, which have been well recognized for many many years. Before, I used to doubt their importance, as we were not able to find them in more than something like 35-50% of all cases, but now, by examining infants in the village at the very earliest stage of the disease one can find them in 100% of cases, and I personally have no doubt now that the elementary granule represents the causal virus of trachoma. There is, I think, sufficient experimental proof of this too.

Thygeson, previously of Iowa, now of New York, has got trachoma in the human with an inoculation of a filtrate containing nothing but elementary bodies.

Busacca and Nataf and Cuenod think that their Rickettsiae are different from the elementary granules of the Prowazek-Halberstaedter body, but I have a

very strong suspicion that they are the same. I am going to try their staining methods, but even with Giemsa (which they say also shows these Rickettsiae) we have not been able to find anything that looks like Rickettsiae other than the elementary bodies.

As for the diet factor, I cannot raise any enthusiasm for the theory at all. The fact that trachoma still occurs in New South Wales west of the wheat belt, even though "the living conditions are good", does not prove much to me.

So far as Egypt is concerned I still say, and see no evidence of the contrary at all, diet has little or nothing to do with the disease. Trachoma is an infectious disease due to a specific virus.

With kindest regards,

I am, Sir James,

Yours very sincerely,

(Signed) ROWLAND WILSON.

TUBERCULOSIS.

SIR: As it is not always possible for one to attend annual congress, I should appreciate the opportunity of expressing, through your columns, my opinion of certain remarks made at the recent congress in Adelaide, as reported in THE MEDICAL JOURNAL OF AUSTRALIA, October 30, 1937, page 802.

I am indeed pleased to know that there is in Queensland such an ardent advocate of tuberculin in treatment as Dr. L. B. Elwell. I entirely agree with him that tuberculin is still "the greatest asset in the treatment of tuberculosis of all types". I will go further and say that tuberculin, properly used, is one of the greatest assets in diagnosis, often establishing or clinching the diagnosis when radiography fails. I refer particularly to tuberculous conditions of the eye, early tuberculous conditions of the joints and even of pulmonary tuberculosis when it has to be distinguished from malignant disease of the lung.

Dr. A. A. Palmer, of Sydney, on the other hand, has voiced opinions which might easily do incalculable harm to the cause of tuberculin. Admittedly it is only his opinion "that deaths still occur from the use of tuberculin", and that in the case instanced by him "the acute spread was due to the injection of tuberculin". It would be interesting to know on what grounds he bases this opinion. Without further details of the case in question it is impossible to estimate the value of his deductions, but the old question of *post hoc* and *propter hoc* must always be remembered. The experience with tuberculin of the person using it is another very important factor. Dr. Elwell, after eighteen years' experience of it, has nothing but good to report. My experience does not extend over such a lengthy period, but, after having given many thousands of tuberculin injections, I can honestly say that I have yet to see an unfortunate or fatal result due to one of them. I do insist, however, that there are certain definite rules which must be strictly adhered to in the successful use of tuberculin, and these cannot be found in any text-book.

Yours, etc.,

W. BRUCE FRY.

131, Macquarie Street,
Sydney,

November 8, 1937.

SIR: IN THE MEDICAL JOURNAL OF AUSTRALIA of November 6, 1937, Dr. Cotter Harvey, in his paper on "The Pathogenesis and Prophylaxis of Pulmonary Tuberculosis", states that "with modern screens fluoroscopy of the chest has become very accurate and the percentage of error is quite small". Fluoroscopy is of some use in studying lung movements and in watching progress of the disease, but if relied upon alone I doubt whether 5% of early cases would be detected. Good films, preferably stereoscopic, are absolutely essential for the diagnosis of early lesions and for demonstrating the extent of more advanced

lesions. I have had considerable practice in chest work, yet I would not give any opinion on fluoroscopy alone. Further, repeated fluoroscopy is a slightly dangerous procedure for the patient, but is an extremely dangerous one for the physician.

Yours, etc.,

J. G. EDWARDS.

"Craignish",
185, Macquarie Street,
Sydney,

November 9, 1937.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

At a recent meeting of the Senate of the University of Sydney the following diplomas were awarded:

Diploma in Public Health: James Tatham Jefferis, M.B., Ch.M.; Brian Andrew Serjeant, M.D., B.S.

Diploma in Tropical Hygiene: Alexander Vivian Gordon Price, M.B.

Diploma in Radiology: Hugo Flecker, M.B., Ch.M.

The Senate has approved the following appointments: Dr. E. S. Wallace, Lecturer in Materia Medica in the Faculty of Dentistry in the place of the late Dr. F. G. Hardwick; Dr. S. A. Smith, a member of the Liston Wilson Fellowship Committee.

Benefactions.—The following benefactions were received: a bequest of £5,000 from the trustees of the estate of the late Dame Edith Walker for general purposes; a gift of £1,000 from the sons and daughters of the late George Judah Cohen, the income to be used to provide for a lecture or lectures on a subject of national importance; a gift of £150 from Miss Helen Simpson for the foundation of an annual prize for a French essay to be known as The Helen Simpson Prize (this prize is open to honours students in French in the Faculty of Arts). The Senate has accepted the foregoing benefactions with grateful thanks.

The Marion Clare Reddall Scholarship for 1938 has been awarded to Mr. K. S. Harrison, M.B., B.S., who has submitted a programme of research work which has been considered satisfactory by the Faculty of Medicine.

Proposed Evening Science Course.—A report from the Evening Students' Association regarding the introduction of evening lectures in the Faculty of Science has been referred to the Professorial Board for submission to the Faculty of Science for consideration and report.

Gift of Valuable Books to the University Library.—Dr. Sydney Nicholson and his brother Sir Charles Nicholson, sons of the late Sir Charles Nicholson, illustrious benefactor of the university, have presented to the university three valuable books, consisting of one fifteenth century and one sixteenth century book and one fourteenth century manuscript. The manuscript is an Italian MS. of about 1370, a commentary by Johannes Andreas on the Sixth Book of the Decretals, and the special interest is that it contains a beautiful illuminated miniature of Pope Boniface with his councillors and his secretary. The miniature is likely to be by Giotto.

The two books are Books of Decretals. One was printed in Venice in 1479 and has beautiful illuminations done by hand. The other is the Sixth Book of the Decretals, printed by Plantin at Antwerp in 1623 with a fine tooled vellum binding. The books are now housed in the Fisher Library.

Obituary.

WALTER ALEXANDER RAMSAY SHARP.

WE regret to announce the death of Dr. Walter Alexander Ramsay Sharp, which occurred on November 9, 1937, at Sydney, New South Wales.

Books Received.

PLASTIC SURGERY OF THE NOSE, by J. E. Sheehan; Second Edition, entirely rewritten; 1936. New York: Paul B. Hoeber; Australia: Angus and Robertson Limited. Imperial 8vo, pp. 201, with 131 text illustrations, including 7 in colour, and 14 full page plates, consisting of 104 photographs. Price: 54s. net.

MEDICO-LEGAL ASPECTS OF THE RUXTON CASE, by J. Glaister, M.D., D.Sc., and J. C. Brasb, M.A., M.D., F.R.C.S. (Edin.); 1937. Edinburgh: E. and S. Livingstone. Imperial 8vo, pp. 309, with 172 illustrations. Price: 21s. net.

AS I WAS GOING DOWN SACKVILLE STREET. A PHANTASY IN FACT, by O. St. J. Gogarty. London: Rich and Cowan Limited; Adelaide and Sydney: F. W. Preece and Sons Limited. Medium 8vo, pp. 330. Price: 18s. 6d. net.

LEAGUE OF NATIONS PUBLICATIONS. THE FINAL REPORT OF THE MIXED COMMITTEE OF THE LEAGUE OF NATIONS ON THE RELATION OF NUTRITION TO HEALTH, AGRICULTURE AND ECONOMIC POLICY; 1937. Geneva: Publications Department of the League of Nations; Australia: H. A. Goddard Limited. Medium 8vo, pp. 327. Price: 7s. 6d. net.

TISSUE REACTIONS IN BONE AND DENTINE. A MORPHOLOGICAL STUDY OF THE FORMATION AND THE DISSOLVING OF BONE AND DENTINE, by A. Wilton, M.D.; 1937. London: Henry Kimpton. Medium 8vo, pp. 194, with illustrations. Price: 15s. net.

Diary for the Month.

- Nov. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 Nov. 24.—Victorian Branch, B.M.A.: Council.
 Nov. 25.—New South Wales Branch, B.M.A.: Branch.
 Nov. 25.—South Australian Branch, B.M.A.: Branch.
 Nov. 26.—Queensland Branch, B.M.A.: Council.
 Dec. 1.—Western Australian Branch, B.M.A.: Council.
 Dec. 2.—South Australian Branch, B.M.A.: Council.
 Dec. 7.—Tasmanian Branch, B.M.A.: Council.
 Dec. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 Dec. 7.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 Dec. 9.—New South Wales Branch, B.M.A.: Branch.
 Dec. 10.—Queensland Branch, B.M.A.: Annual Meeting.
 Dec. 14.—Tasmanian Branch, B.M.A.: Branch.
 Dec. 14.—New South Wales Branch, B.M.A.: Ethics Committee.
 Dec. 15.—Western Australian Branch, B.M.A.: Branch.
 Dec. 17.—Queensland Branch, B.M.A.: Council.
 Dec. 21.—Tasmanian Branch, B.M.A.: Council.
 Dec. 21.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 Dec. 30.—South Australian Branch, B.M.A.: Branch.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," pages xiii to xv.

- AUSTIN HOSPITAL FOR CHRONIC DISEASES, HEIDELBERG, VICTORIA: Honorary Assistant Physician.
 CHILDREN'S HOSPITAL (INCORPORATED), PERTH, WESTERN AUSTRALIA: Junior Resident Medical Officers.
 DEPARTMENT OF PUBLIC HEALTH, ROEBOURNE, WESTERN AUSTRALIA: Resident Medical Officer.
 FREMANTLE HOSPITAL, FREMANTLE, WESTERN AUSTRALIA: Resident Medical Officers.
 HOBART GENERAL HOSPITAL, HOBART, TASMANIA: Resident Medical Officers.
 SAINT VINCENT'S HOSPITAL, MELBOURNE, VICTORIA: Resident Medical Officers.
 THE TOWNVILLE HOSPITALS BOARD, TOWNVILLE, QUEENSLAND: Resident Medical Officers.
 THE UNIVERSITY OF MELBOURNE, VICTORIA: Senior Lectureship in Anatomy.
 THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Resident Medical Officers.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
NEW SOUTH WALES: Honorary Secretary, 135 Macquarie Street, Sydney.	
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178 North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

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